APRIL 13, 1946

Railway Age

Founded in 1856

McCARTNEY LIBRARY
COLLEGE

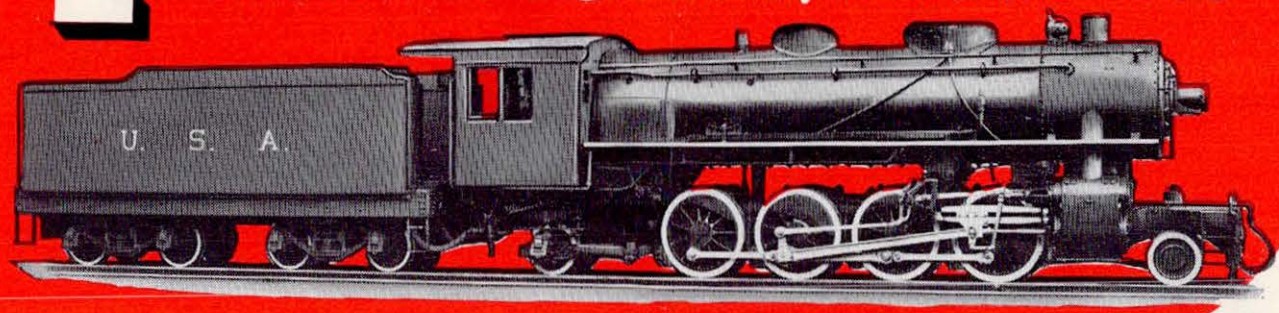
Interlocking

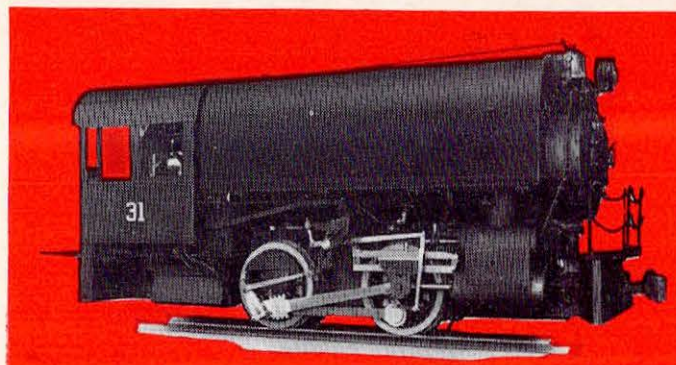
DROP END LOCK

FOR ALL DROP END GONDOLA CARS

THE WINE RAILWAY APPLIANCE CO.
TOLEDO 9, OHIO

PORTER Steam Locomotives

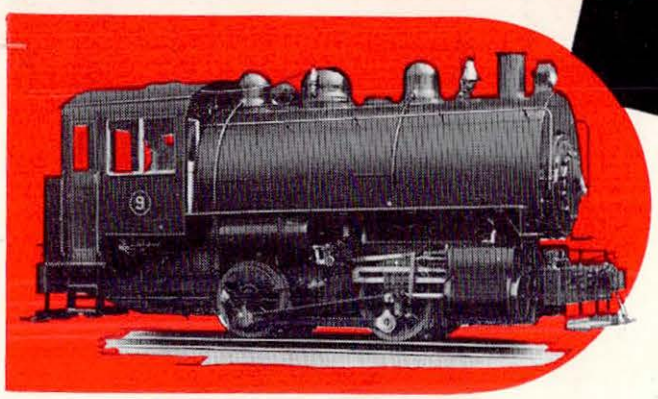




Lower Operating Costs

Less Maintenance

Greater Availability



Here are some of the features that give PORTER Locomotives their EXTRA STAMINA

1. Extra-heavy frames, flame-cut from solid, heavy-section, Universal mill plate. Annealed and heat-treated after cutting.
2. Axles, crank pins, guides, rods, and other strain-bearing parts solid-forged from best quality open hearth steel.
3. Extra large bearing surfaces on all moving parts.
4. Accurate machining of all wearing and fitted surfaces.
5. Case-hardened pins and bushings at all vital parts.

PORTER "Better Built" Equipment
Established 1866

ARMY E NAVY

LOCOMOTIVE DIVISION:
Diesel, Diesel-Electric, Steam and Fireless Steam Locomotives

FORT PITT SPRING DIVISION:
Coil and Elliptic Springs for Locomotives, Freight and Passenger Cars.

PROCESS EQUIPMENT DIVISION:
Complete Line of Chemical, Food, and Petroleum Refinery Equipment.

QUIMBY PUMP DIVISION:
Screw, Rotex, and Centrifugal Pumps.

HINDERLITER TOOL DIVISION:
Oil Well Drilling Equipment.

H. K. PORTER COMPANY, Inc.

PITTSBURGH, PA. • BLAIRSVILLE, PA.

NEWARK, N.J. • NEW BRUNSWICK, N.J. • MT. VERNON, ILL.

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"I never had a smoother ride in my life"

Every so often, you'll hear a passenger pay that tribute to the railroad and the car-builder.

When he says it, he may not be thinking of the part the wheels played. Nevertheless, the wheels have had a big share in providing the smooth, comfortable ride that so pleased him. The chances are good, too, that those wheels were made by Bethlehem.

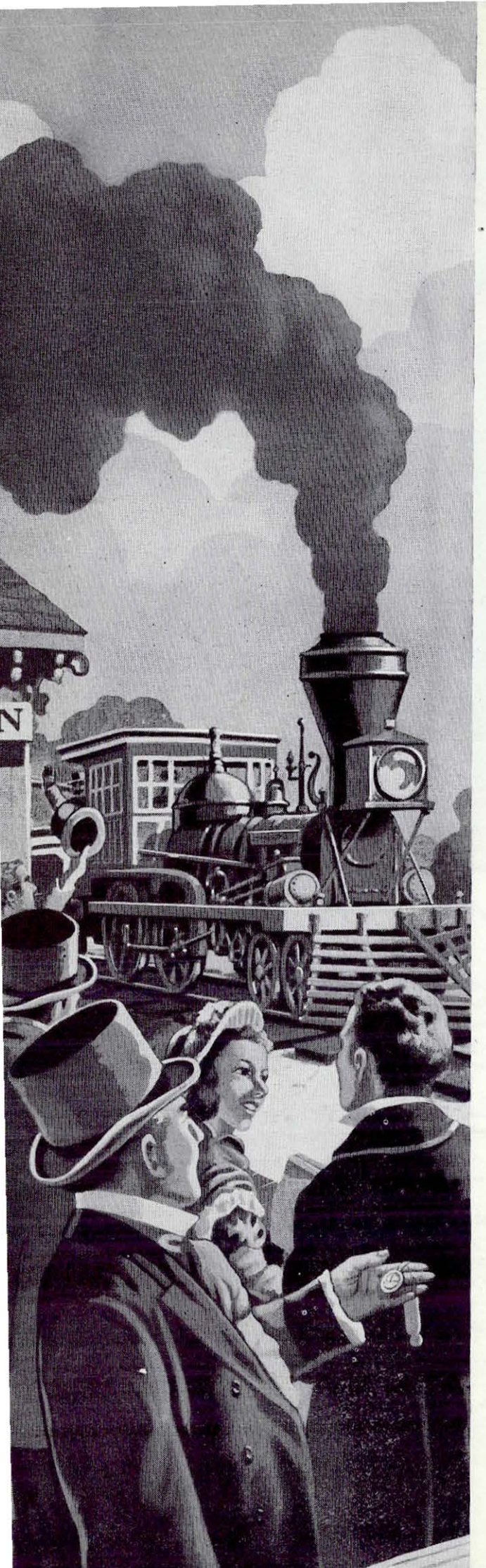
On many of the nation's crack passenger trains, Bethlehem wrought-steel wheels are in daily service. They help to insure the smooth ride that contributes so heavily to the comfort of the passenger. But, even more vital, they are tough and wear-resisting. Sturdiness and high mileage are worked right into them by the Bethlehem forging, rolling, and heat-treating processes.

Worked right into them. That tells the story! A story of fewer replacements . . . lower maintenance...lower overhead...better performance.

A Bethlehem forged-steel axle is every bit as rugged, every bit as sturdy, as a Bethlehem wrought-steel wheel. Together they're your best bet in running gear for up-to-the-minute passenger service.

BETHLEHEM *Wrought-Steel* WHEELS

FORGED-STEEL AXLES



CHECKS that have come every year for 100 years

SINCE its founding 100 years ago, the Pennsylvania Railroad has paid to its employees, stockholders and bondholders approximately twelve and a half billion dollars.

Never once over that century has it failed to meet a financial obligation when due.

To its employees the Pennsylvania has paid in wages a sum exceeding ten billion dollars.

To stockholders, it has paid a cash return in every year since 1847—a total of a billion and a quarter dollars.

To bondholders—individuals, and insurance companies, savings banks, trust companies, representing the savings of many millions of individuals—it has paid in interest more than a billion dollars.

From the beginning, the Pennsylvania has been a railroad built by the people for the people. The money to construct it as the shortest route between East and West came from people of all walks of life in the form of subscriptions to shares of $50 each, payable in ten $5 installments. Today, with 13,167,754 shares outstanding, the average holding is only 61¼ shares, and of the 214,995 stockholders of the railroad 106,139—or more than 49%—are women.

Thus, not only has the Pennsylvania Railroad served the American people through continually improving transportation at low cost—but through wages, dividends and interest (plus huge purchases of materials in the area served)—it has contributed vitally to the prosperity of communities and to the welfare and economic security of many thousands of American citizens.

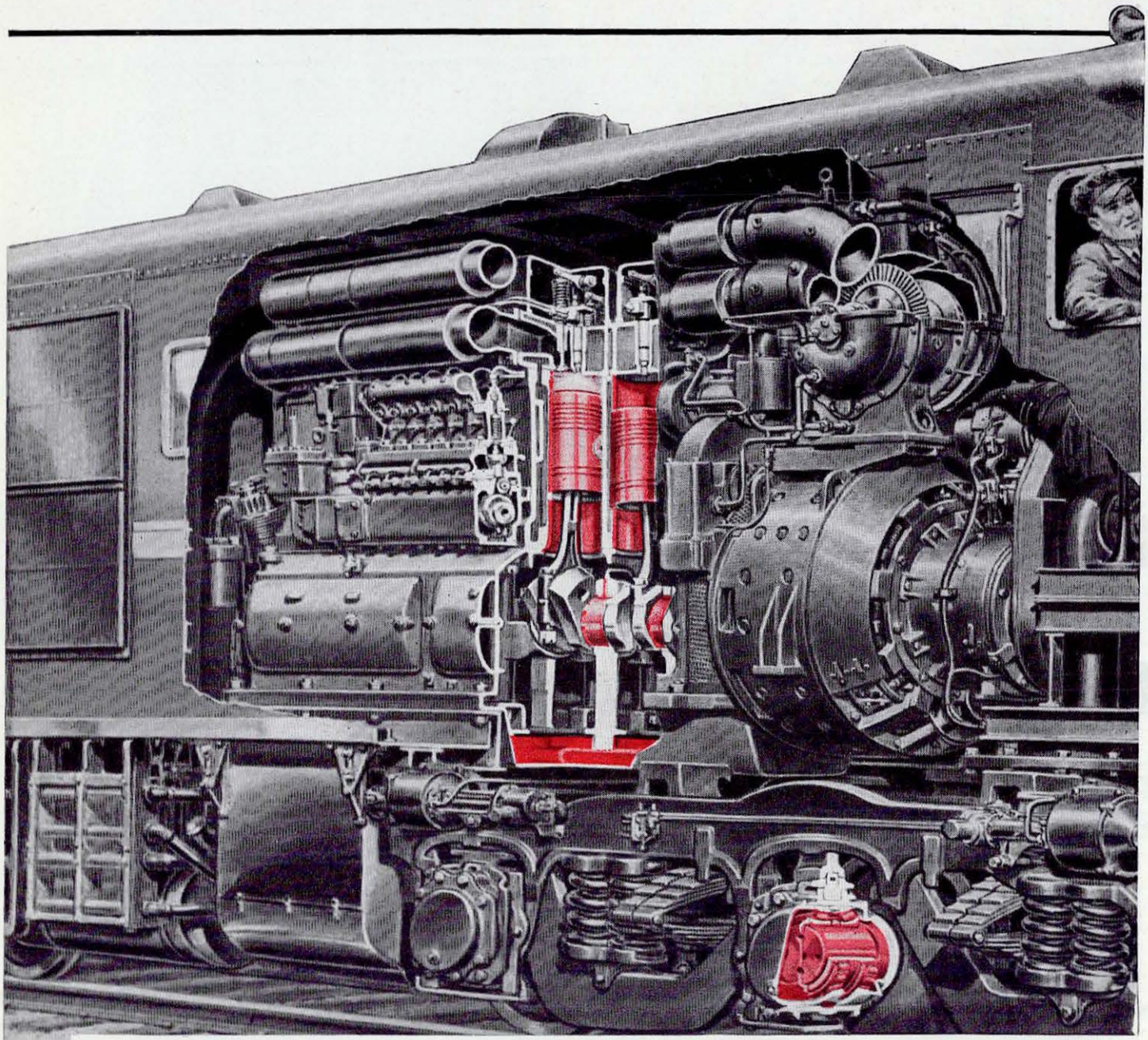
PENNSYLVANIA RAILROAD

1846 *1946*

ONE HUNDRED YEARS OF TRANSPORTATION PROGRESS

5505
PENNSYLVANIA

HIGHBALLING POWER



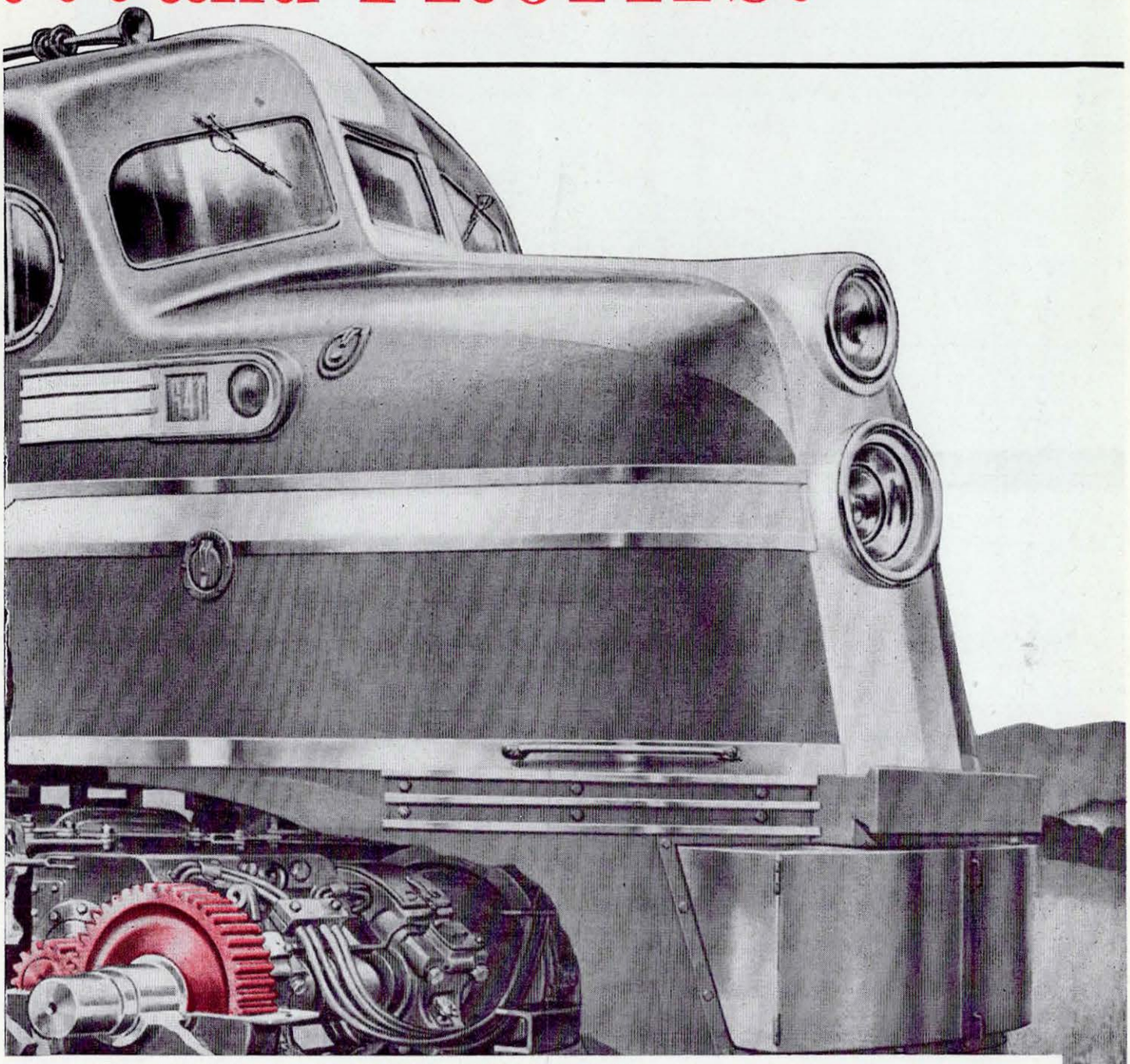
Quality Railroad Lubricants
by SOCONY-VACUUM
assure availability
of ALL Railroad Equipment

● This cutaway of a Diesel-electric mainliner shows you where continuous, economical operation is influenced by correct lubrication.

Inside the Diesels, gas temperatures soar to 3000°F., pressures to above 700 lb. per sq. in. Gargoyle D.T.E. Oil stands up under this terrific heat and pressure. It resists the formation of deposits, maintains protecting oil films, forms a tight piston seal. In addition, this same stable lubricant assures uninterrupted service of auxiliaries.

Those driving motor pinions and gears operate under weather temperatures of from minus 50°F. to 120°F. with dust and water

. . . and PROFITS!



This cutaway drawing was prepared with the cooperation of the American Locomotive Company

often present. Here, special Socony-Vacuum gear lubricants stick to the job and protect against wear. On the many grease-lubricated parts Gargoyle greases stand up for long periods.

You can get this same quality protection for *all* your equipment by calling your Socony-Vacuum Representative.

SOCONY-VACUUM OIL COMPANY, INC.
and Affiliates: Magnolia Petroleum Company, General Petroleum Corp. of Calif.

TUNE IN "INFORMATION PLEASE" — MONDAY EVENINGS, 9:30 E. S. T. — N B C

GARGOYLE

Railroad Lubricants

MAIN LINE OF THE NATION

Celebration, this month, of the Pennsylvania Railroad's one hundredth anniversary, focuses attention on the significance of the Pennsylvania's great achievements in its century of service to the nation.

Those hundred years are an epic of human endeavor. They represent the triumph of courage, imagination and energy in building more than the world's greatest railroad, but actually a tremendous share in building the nation itself.

Lifeline of our industry and commerce, the Pennsylvania joins coal and steel; meat and markets; producers and consumers of every kind.

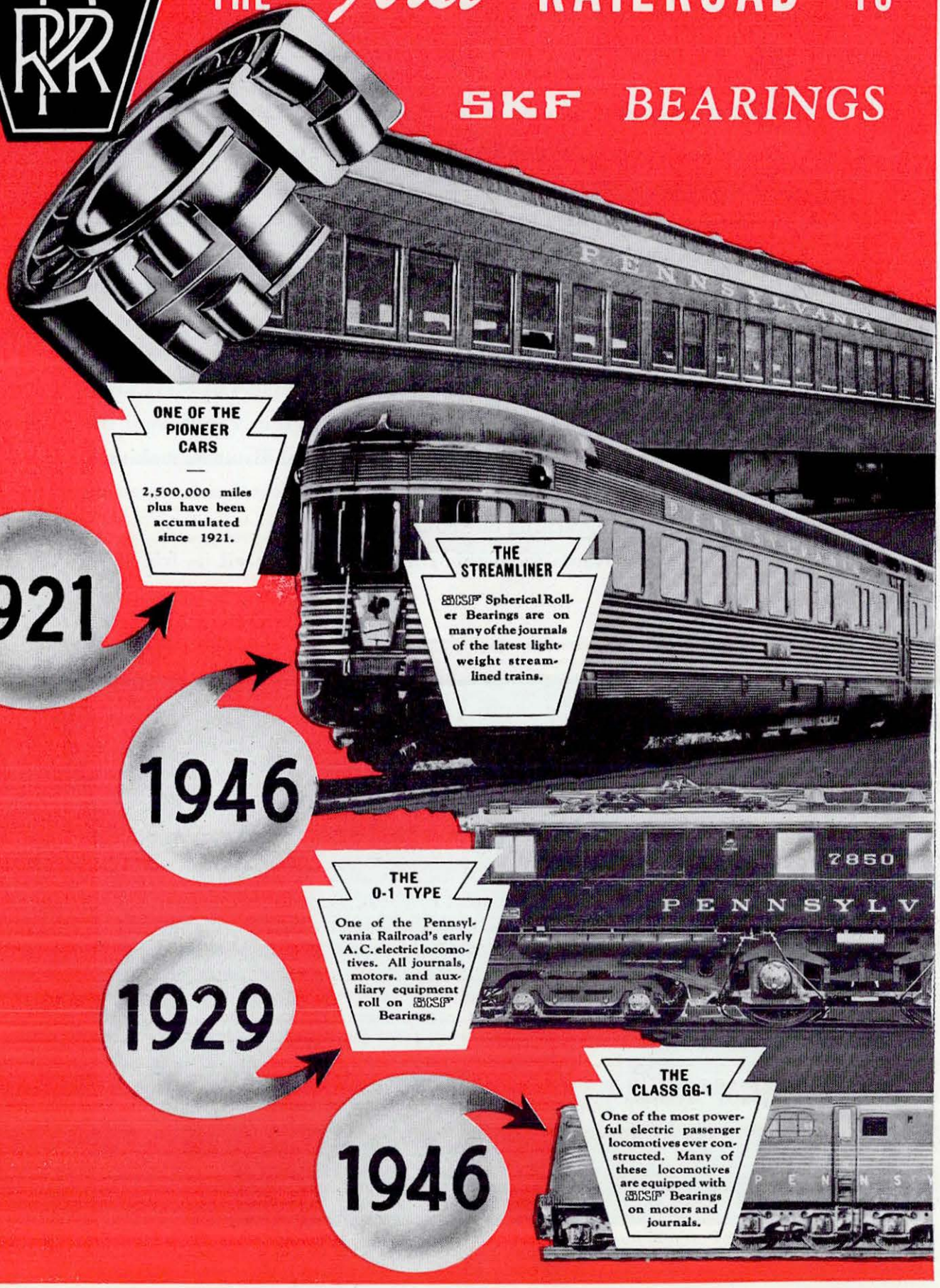
These are important beyond assessment. But they result from the far greater achievement of overcoming barriers of distance, making it possible for men of vision and goodwill to work together in creating, unifying and strengthening our country.

To the Pennsylvania from this company, as from all its friends—Congratulations!

EDWARD G. BUDD MANUFACTURING COMPANY

Budd

THE *First* RAILROAD TO SKF *BEARINGS*



1921

ONE OF THE PIONEER CARS

2,500,000 miles plus have been accumulated since 1921.

1946

THE STREAMLINER

SKF Spherical Roller Bearings are on many of the journals of the latest lightweight streamlined trains.

1929

THE 0-1 TYPE

One of the Pennsylvania Railroad's early A. C. electric locomotives. All journals, motors, and auxiliary equipment roll on SKF Bearings.

1946

THE CLASS GG-1

One of the most powerful electric passenger locomotives ever constructed. Many of these locomotives are equipped with SKF Bearings on motors and journals.

USE *Roller* BEARING JOURNALS!

INSTALLED IN 1921!

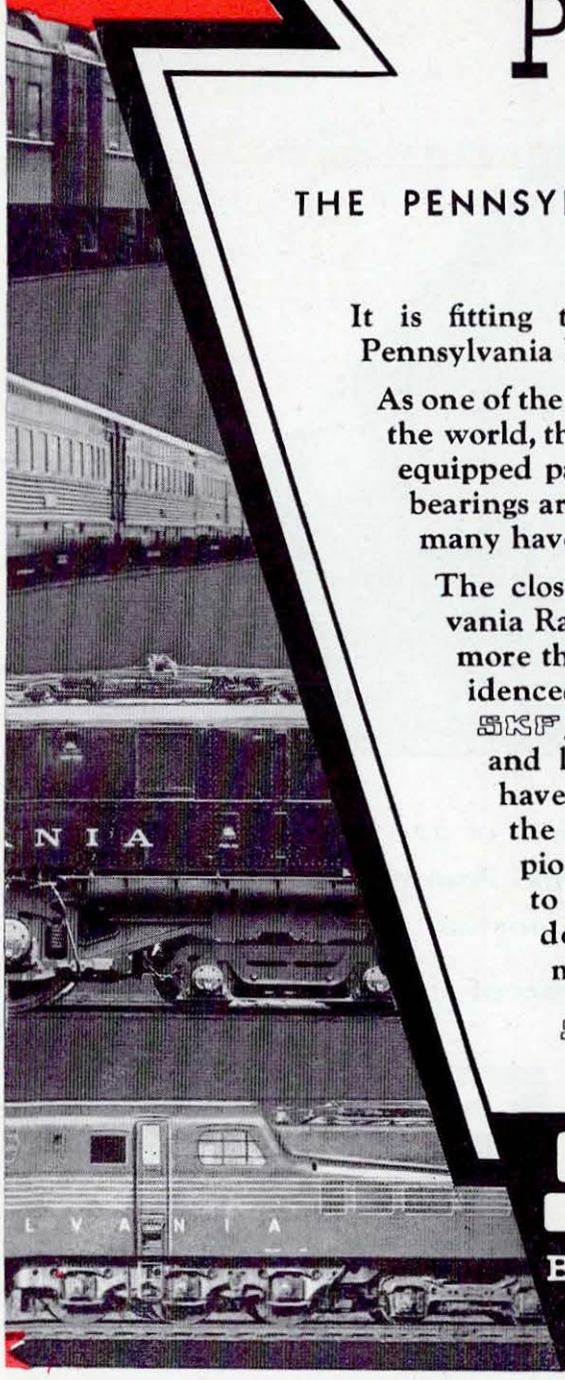
PIONEERS

THE PENNSYLVANIA RAILROAD AND SKF

It is fitting that SKF pays special tribute to the Pennsylvania Railroad on its 100th Anniversary.

As one of the greatest and most progressive railroads in the world, they placed the first roller bearing journal equipped passenger cars in service in 1921. The bearings are SKF Spherical Roller Bearings and many have now run over 2,500,000 miles.

The close association between the Pennsylvania Railroad and SKF has continued for more than a quarter of a century and is evidenced in repeat orders totaling 8,624 SKF Journal Bearings for passenger cars and locomotives. SKF is proud to have had the opportunity of joining the Pennsylvania Railroad in this pioneering achievement leading to today's high speed service, dependability and reduced maintenance. 6081

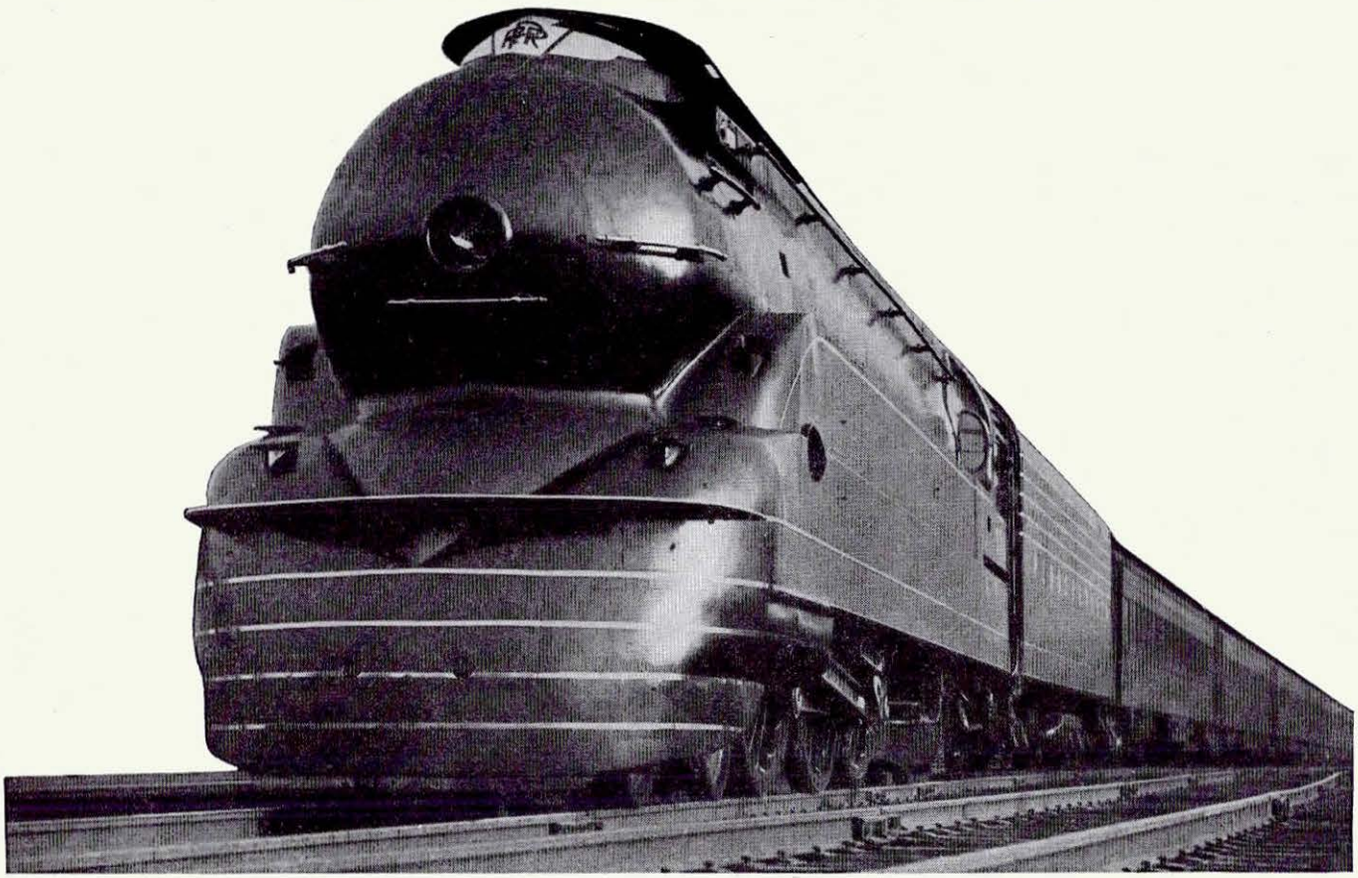


SKF INDUSTRIES, INC.
PHILADELPHIA 34, PA.

SKF
BALL AND ROLLER
BEARINGS

1846 · 1946

EXIDE CONGRATULATES THE PENNSYLVANIA RAILROAD ON ITS 100th ANNIVERSARY



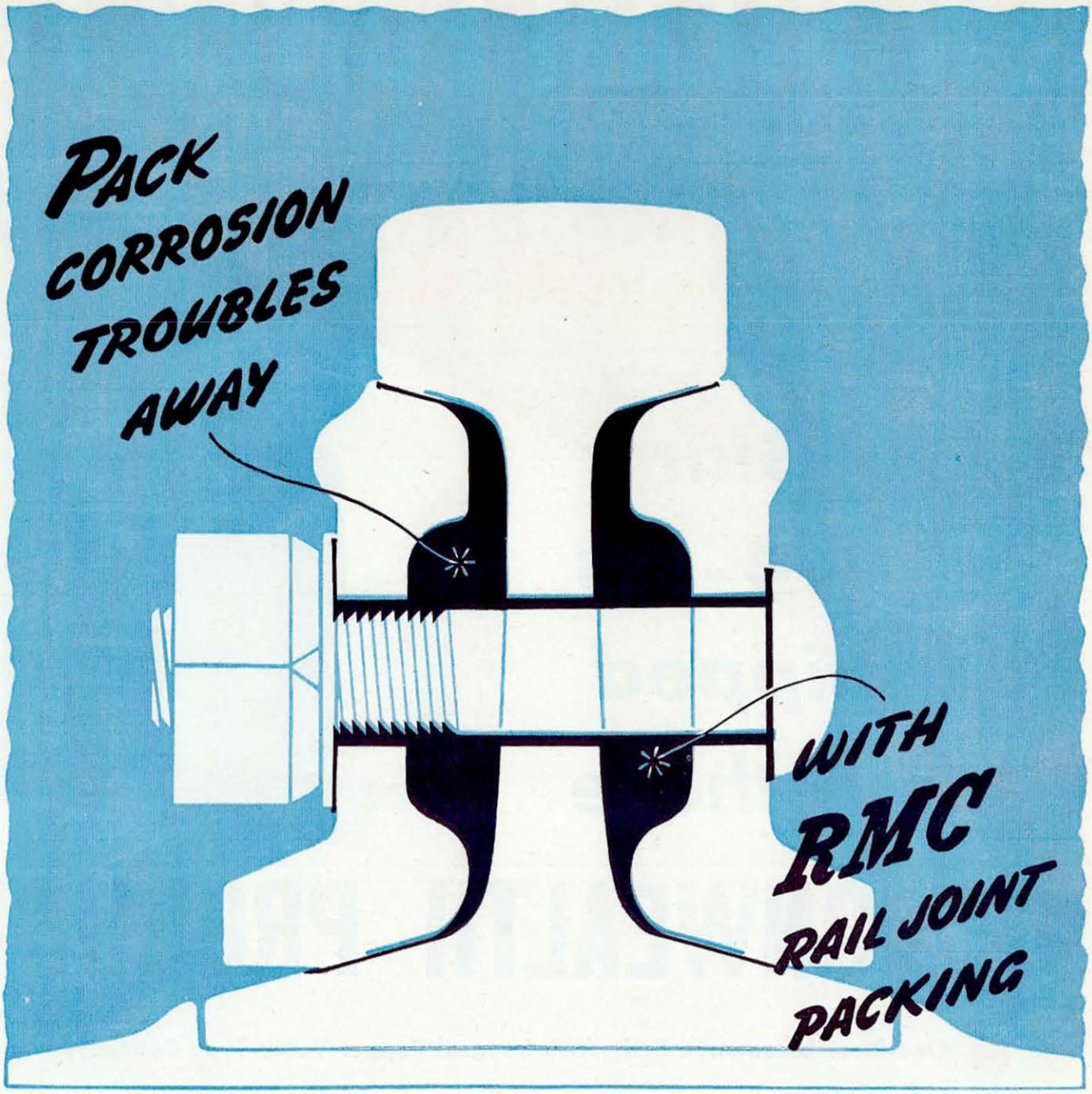
Uncounted billions of passengers and other billions of tons of freight have rolled over the rails since the pioneer days of the Pennsylvania Railroad, which this month enters its second century of progress.

Exide congratulates the Pennsylvania on its 100 years of service to the public and wishes it equal success in the years ahead.

Since 1891, Exide has been serving America's leading railroads . . . progressing as they progressed . . . meeting each new battery need as it arose . . . serving with dependability, long-life and ease of maintenance.

Exide BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto



One application of RMC Rail Joint Packing stops rail joint corrosion for the life of the joint. It is the modern method of permanently protecting rail joints and has been used successfully on millions of them by leading roads. In addition to preventing corrosion, RMC Packing assures that properly tensioned bolts will not "freeze" the joint and cause kinked or humped track. Write today for complete information.

RAILWAY MAINTENANCE CORP.

PITTSBURGH 30, PENNSYLVANIA

NEW STEAM POWER FOR

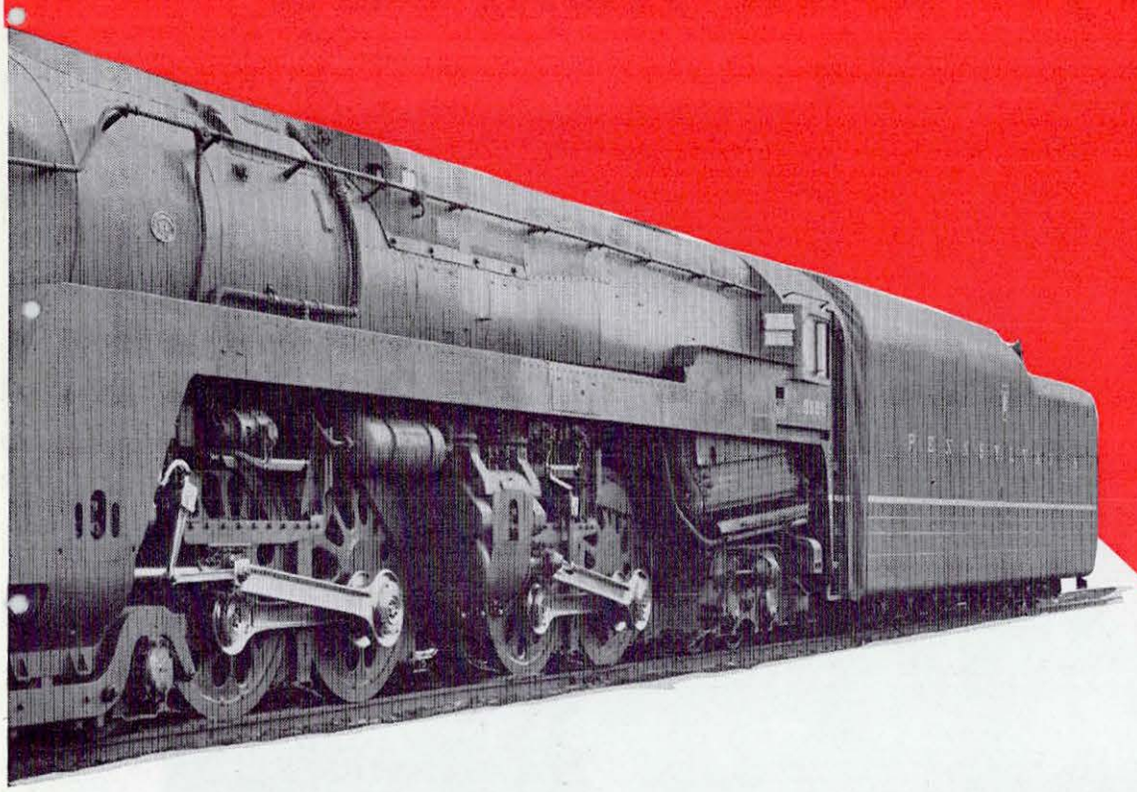
50 Giant 4-4-4-4's Equipped with these

COMMONWEALTH PRODUCTS

- One-Piece Locomotive Beds With Integral Poppet Valve Type Cylinders
- Boxpok Driving Wheel Centers
- Engine Truck Frames and Bolsters
- Delta Type Trailer Truck Frames
- One-Piece Waterbottom Tender Frames
- 8-Wheel Tender Truck Frames

GENERAL STEEL

THE PENNSYLVANIA!



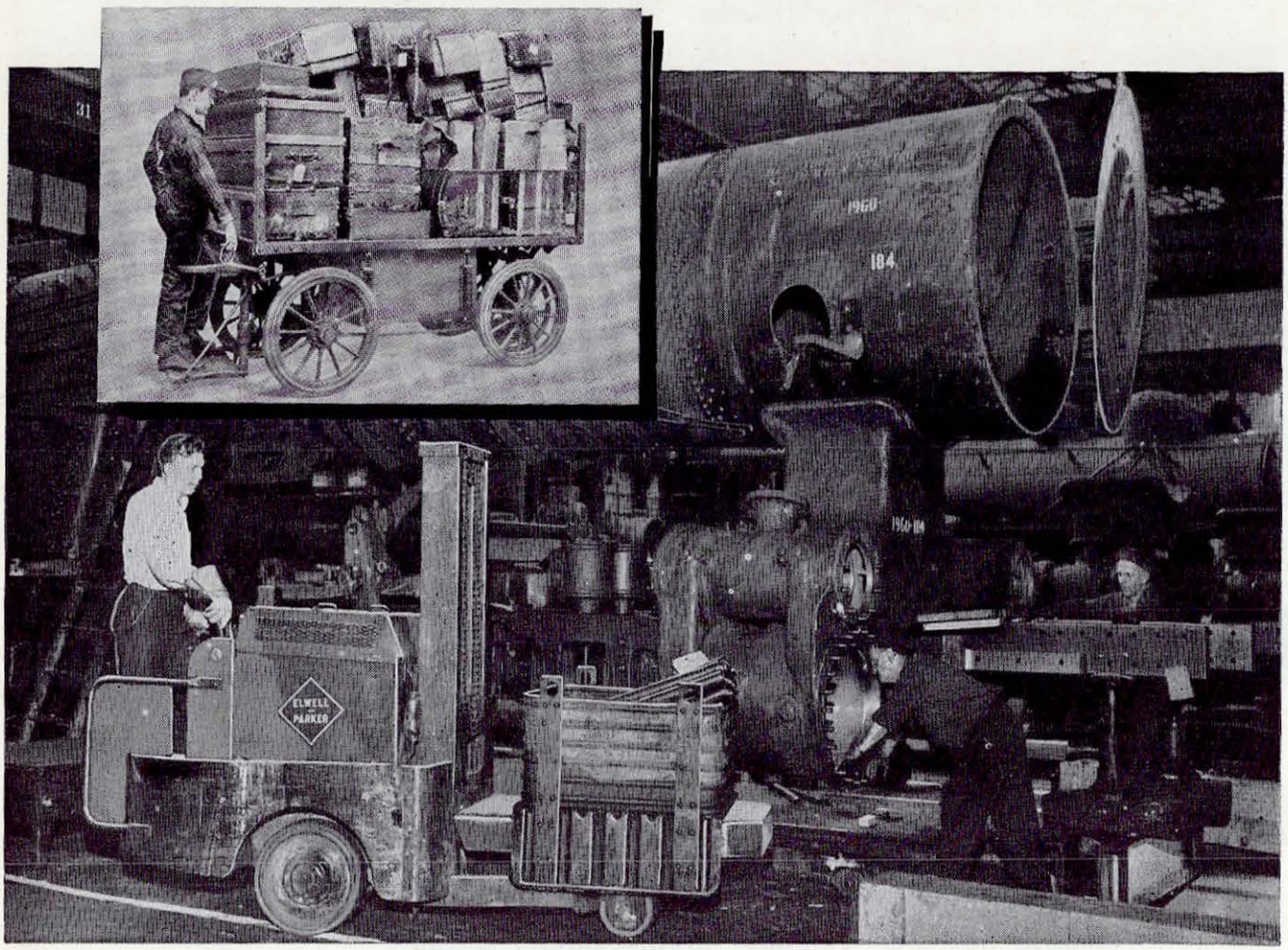
Built by
Baldwin and P.R.R.
Altoona Shops

These new Pennsylvania multi-cylinder steam locomotives will produce great power and speed. They are designed to increase the efficiency and economy of operation in through passenger and fast freight service.

COMMONWEALTH One-Piece Cast Steel Devices assure greater strength with less weight, eliminate hundreds of separate assembled parts. The result is longer active locomotive service, reduction in shopping cost and maintenance expense.

CASTINGS EDDYSTONE, PA.
GRANITE CITY, ILL.

Elwell-Parker *Salutes the Pennsylvania Railroad*



Power Electric Trucks have come a long way, too!

Honors to "the Pennsylvania" for its 100 years of transportation pioneering—and for its ambitious forward program, launched as its second century gets under way.

And recognition, too, of the Pennsylvania's major role in giving the Electric Truck Industry an early, encouraging start. Because the crude little affair illustrated at the upper left—the first battery-powered load-handling unit on record—was assembled 40 years ago in the Pennsylvania's Altoona Shops from these "ingredients":

A hand-drawn baggage truck, Elwell-Parker motors, some small storage batteries and the confidence of 2 men with vision to pierce the long future as well as solve an urgent problem at Jersey City.

Electric Trucks *have* come a great way since then. Elwell-Parker now builds standard types to handle up to 10,000 pounds—as well as "specials" to handle up to 50,000 pounds—for all Railroad Departments from Locomotive- and Car-building to Passenger Terminals, Revenue Freight and Stores.

And Elwell-Parker *continues* to aid in applying Industrial Logistics—the science of moving bigger pay loads faster, more safely, with progressively greater economies. The Elwell-Parker Electric Company, 4250 St. Clair Avenue, Cleveland 14, Ohio.

You are invited to get "re-acquainted" with the Elwell-Parker Railway Specialist in your Main Line City. He can assist in developing cost-reducing Electric Truck and Crane Systems to transport, self-load and tier your materials in large Master Units on Pallets or Skids.

ELWELL-PARKER

POWER INDUSTRIAL TRUCKS

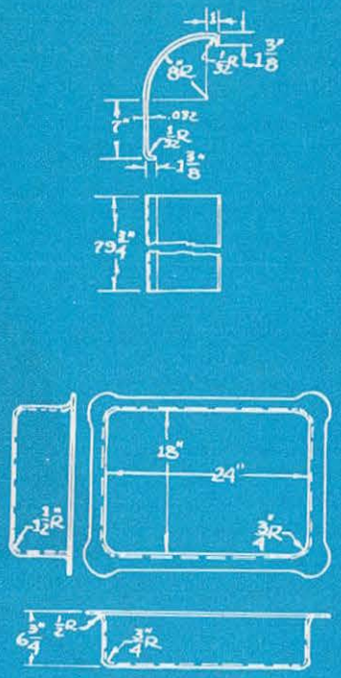
Established 1893

Light Metals give your product new selling features!

COLGATE

DESIGNING • ENGINEERING • FABRICATING • ASSEMBLING

will get it to market *faster, better, economically!*

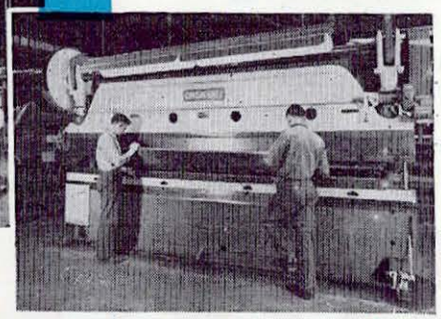


If the manufacture of your new or improved product has been interrupted by factors beyond your control, the urgency of getting it to market ahead of competition is of paramount importance. To secure immediate parts-production assistance and other benefits of sub-contracting service you will be interested in the comprehensive scope of COLGATE'S "Engineered Service."

This unique and unexcelled service offers immediate design, engineering, and production conferences that help develop your new product ideas or improve old products by substituting Aluminum, Magnesium, or Stainless Steel for other materials. Our cooperative collaboration of minds will save you time and money *before* designs have been started, also after blueprints have been prepared. COLGATE'S sales-minded designers and engineers will apply to your product these sales-building features of Aluminum, Magnesium, Stainless Steel—*lighter weight, added beauty, increased strength and durability, improved product performance, reduced shipping weight.*

COLGATE'S complete and varied tooling and production facilities can be your "branch factory" — providing ample space, supplying specialized skills and know-how, planning shortcuts for fast, economical fabrication and assembling of parts to precision tolerances, and in addition offer modern straight-line techniques that replace slower and costlier methods. And, COLGATE can be depended upon to meet delivery dates.

As the first step towards producing your product better and economically, and getting it to market faster call on COLGATE *now!* Learn how "Engineered Service" helps solve your production problems and gives your product the sales creating features of the light metals. For immediate action wire or write, no obligation, complete confidence assured.



STAMPING • FORMING • DRAWING • WELDING
FINISHING • ASSEMBLING

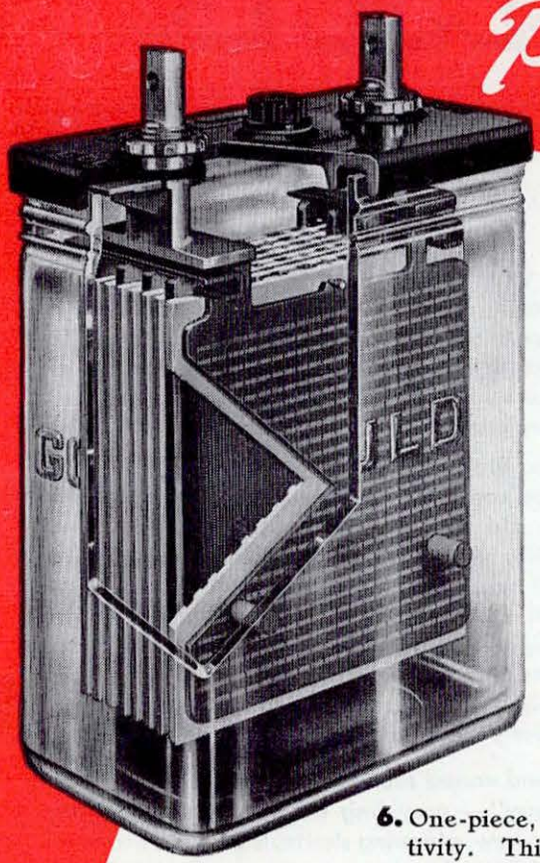
COLGATE'S complete and centralized facilities include Hydraulic presses ranging from 10 to 750 ton capacity, other mechanical presses from 2½ to 200 ton capacity.

COLGATE *Aircraft Corporation*

AMITYVILLE, LONG ISLAND . . . NEW YORK

LIGHT METALS PRODUCTS

WHY DO SIGNAL ENGINEERS SAY *Planté* IS BEST?

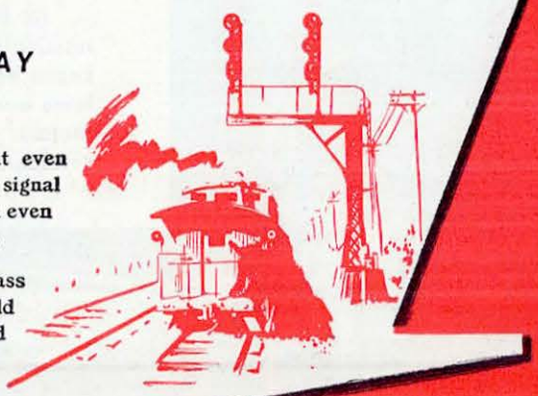


1. One-piece, pure lead positives provide full plate performance throughout battery life.
2. One-piece, pure lead positives assure highest discharge rate for unfailing operation of interlocking equipment.
3. One-piece, pure lead positives assure high discharge rates for car retarding equipment. Current output averages more than 23% in excess of equivalent batteries.
4. One-piece, pure lead positives without holding structures, provide longest possible life. They prevent partial deterioration resulting in loss of capacity.
5. A dense film of active material covers entire plate area. This prevents peroxidization and disintegration, both of which result in lowered current output and shortened battery life.
6. One-piece, pure lead positives give greatest conductivity. This is due to intimate contact of active material formed from the plate itself. Dependence upon mechanical electrical contact is avoided.

. . . BEST FOR ALL RAILWAY SIGNAL SERVICES

Gould Plante batteries supply unfailing current even under the adverse conditions met in railway signal services. They give years of trouble-free operation even under high charging rates and extremes of weather.

Gould also makes Kathanode and Dreadnaught glass jar batteries. Write Dept. 154 for Catalog 900 on Gould Railway Signal Batteries, or Catalog 1000 on Gould Sealed-in-Glass Batteries for Stationary Applications.



GOULD *Planté*

PURE LEAD FOR LONGEST LIFE

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y. Factories: Atlanta • Boston • Chicago • Dallas • Depew
Leavenworth • Los Angeles • North Bergen • Rock Island • Saint Paul • Salem • Sioux City • Zanesville

A GREAT NEW DIESEL-ELECTRIC

from Alco GE

Built TO SELL

AMERICAN LOCOMOTIVE

A GREAT NEW DIESEL-ELECTRIC

from Alco GE

Built TO SELL

AMERICAN LOCOMOTIVE

MORE TON-MILES

TO IMPROVE SERVICE
TO REDUCE OPERATING COST
TO INCREASE EARNING POWER

To sell railroad service against stiffening competition, the new Alco-G.E. 1500-hp diesel-electric combines brilliant performance with great reliability and exceptionally low operating cost. It makes possible smoother, faster, more frequent service—and at a cost that will turn more of your revenue per ton-mile into net operating profit.

Horsepower To Spare

From coupler to coupler, the "1500" is packed with the extra performance needed to improve service even under critical operating conditions. Conservatively rated, it has horsepower to spare. The unusually high continuous and short-time tractive effort ratings of its motors permit hauling greater tonnage over a given profile. These characteristics give the locomotive the ability to meet wide ranges in railroad hauling demands, in respect to both tonnage and speed.

Low Operating and Maintenance Cost

Exceptional economy of operation and high availability are built into this Alco-G.E. locomotive. The use of experience-proved features, in combination with new war-tested developments, results in lower cost of fuel, lubrication, and maintenance. The completely practical design minimizes the time required for routine inspection and servicing and makes possible high day-to-day availability. The sturdy construction is your assurance that this low operating cost and high availability will continue year after year—long after the locomotive has paid for itself.

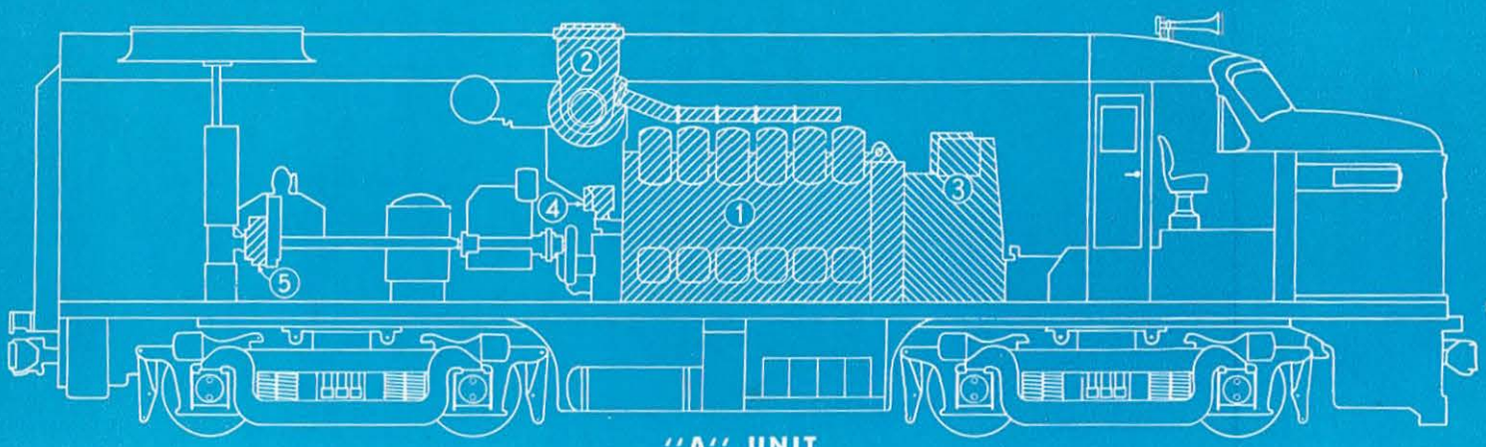
Alco GE

and GENERAL ELECTRIC

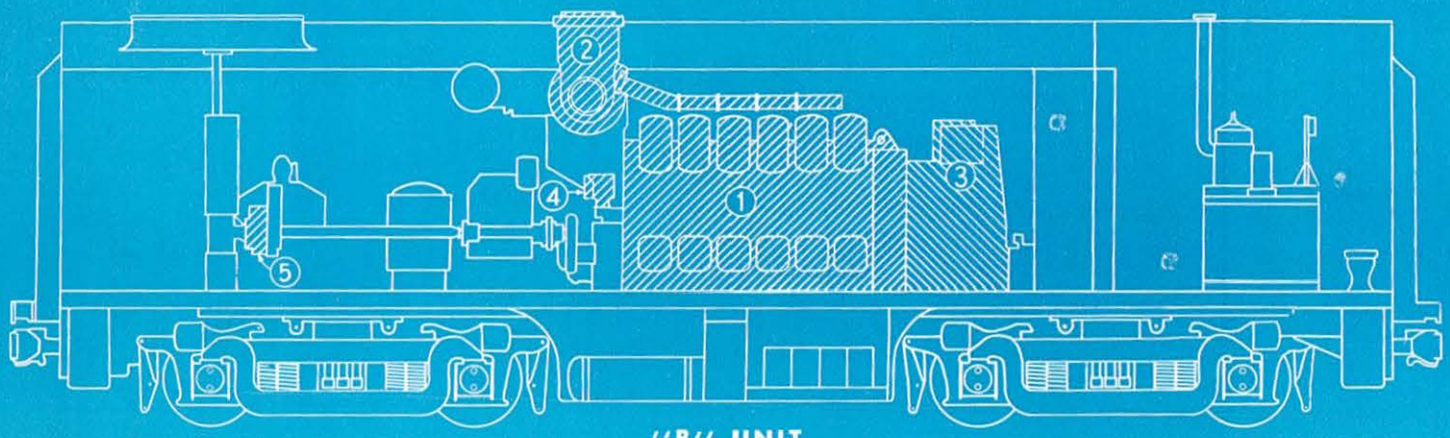
113-153-9580

THESE ALCO-G.E. FEATURES INSURE

BETTER SERVICE AT LOWER COST



"A" UNIT



"B" UNIT

1. V-TYPE, 12-CYLINDER ALCO DIESEL ENGINE, operating at 1000 rpm, combines extremely light weight with high output and low fuel and lubricating oil consumption.

2. CONSTANT-PRESSURE TURBOSUPERCHARGER was developed by G.E. out of wartime experience gained in design and construction of turbosuperchargers for the Army Air Force. This unit boosts engine horsepower, and holds rated horsepower constant up to at least 8000 feet altitude.

3. ELECTRIC TRANSMISSION permits maximum utilization of the diesel engine at the rails over the full range of locomotive speed.

4. POWER PLANT REGULATING SYSTEM combines the advantages of hydraulic and electric control. It provides superior control of throttle, fuel limit, load control, and engine overspeed. Close regulation of engine speed permits maximum utilization of available engine horsepower for traction regardless of variable auxiliary load, and at the same time provides absolute protection against engine overloading.

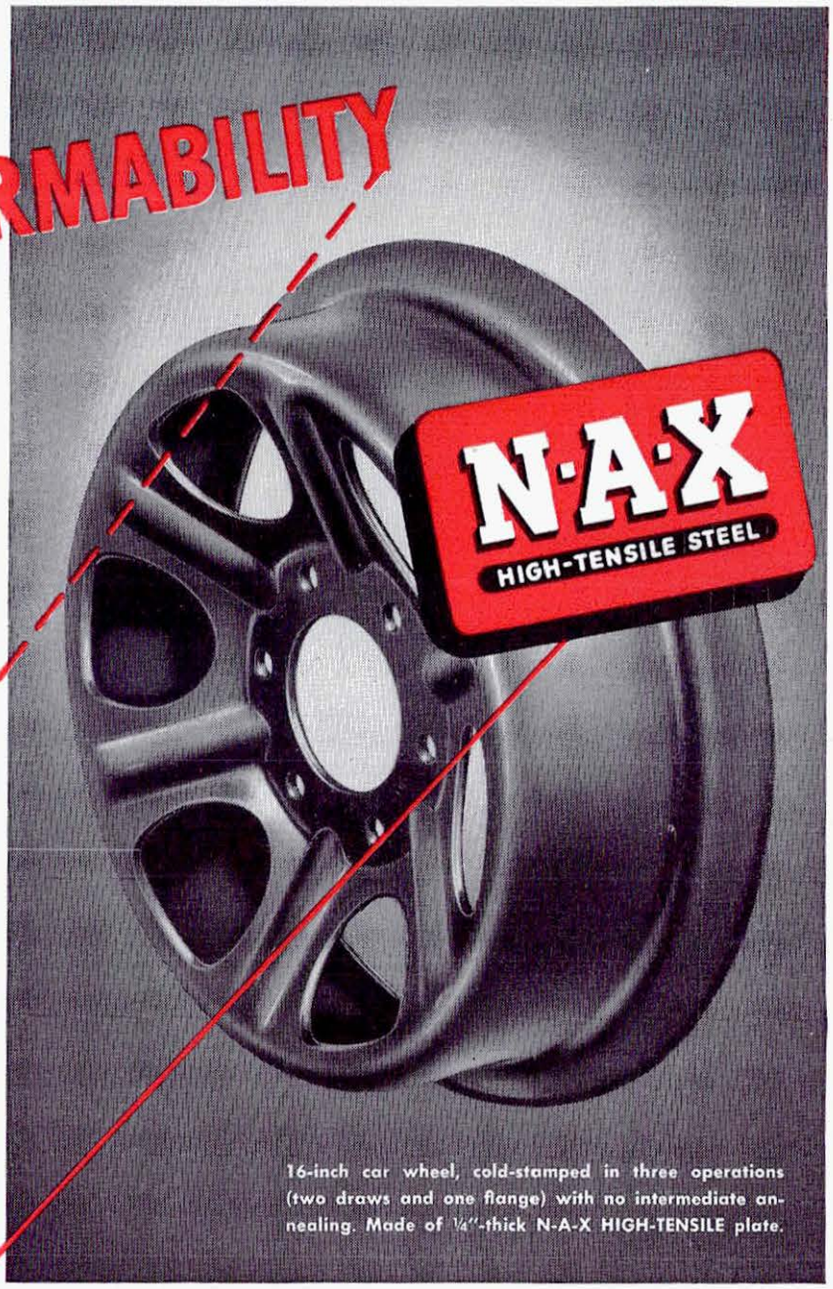
5. THERMOSTATIC CONTROL OF ENGINE COOLING SYSTEM automatically insures correct adjustment of radiator fan to maintain temperature of diesel engine within the narrow range so vital to most efficient operation.

These and many more features will be revealed in the weeks ahead. For complete information get in touch with your Alco or G-E representative.

Alco GE

AMERICAN LOCOMOTIVE and GENERAL ELECTRIC

EASY FORMABILITY



16-inch car wheel, cold-stamped in three operations (two draws and one flange) with no intermediate annealing. Made of ¼"-thick N-A-X HIGH-TENSILE plate.

N-A-X HIGH-TENSILE STEEL HAS ALL SIX — KEEPS ALL SIX

- HIGH STRENGTH
- EXCELLENT WELDABILITY
- HIGH FATIGUE-RESISTANCE
- GREAT IMPACT TOUGHNESS
- HIGH CORROSION-RESISTANCE

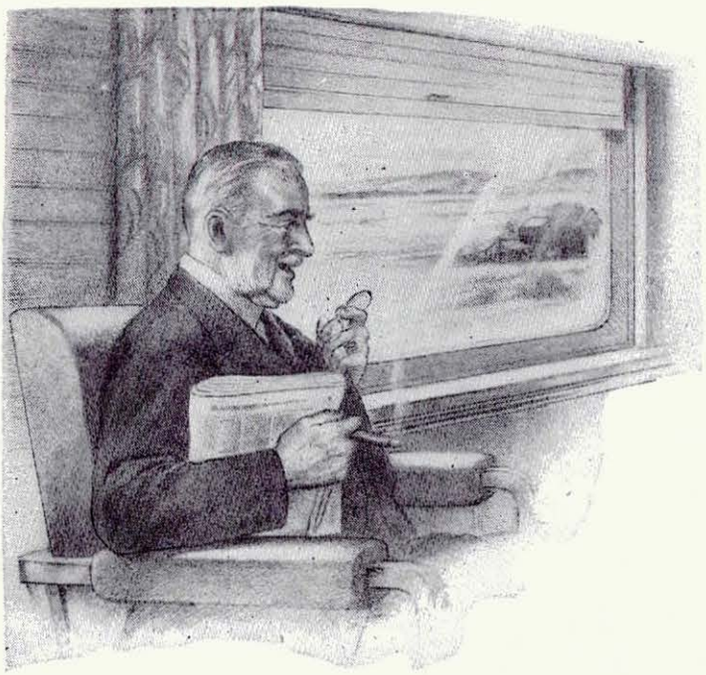
GREAT STEEL FROM GREAT LAKES

. . . WITHOUT LOSS OF OTHER CHARACTERISTICS

Because of an unusual combination of physical properties that are inherent in the steel, N-A-X HIGH-TENSILE will take deep and difficult cold forms *without losing other desirable characteristics.* It retains structural strength, impact toughness, fatigue-resistance, excellent weldability and high corrosion-resistance during and after production processes. It makes possible lighter, stronger, more durable parts and products, and greater economy in manufacturing. For better steel stampings, specify N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION



I Like Comfort, *says* *R. R. Rider*

(Number two of a series)

Some of my friends think I'm a little queer when I tell them I still get a kick out of riding trains. "You're a big boy now, Bob," they tell me, "and after all, you and the steam locomotive are practically the same age. It's been many a long year since your papa took you on your first choo-choo ride."

Well, I can stand kidding, but it's still a fact; I get a thrill every time I walk through a train gate, but you can bet it wouldn't be that way if I didn't get comfort on my trips. Say what you will, you can't beat trains for comfort. You can relax on a train. You're well fed. You can sleep. And you're looked after by people who work hard to make your trip pleasant.

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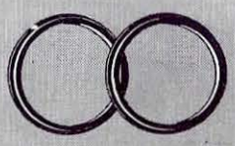
Edgewater

Serving America's Railroads

RING SPRING DRAFT GEARS

ROLLED STEEL WHEELS

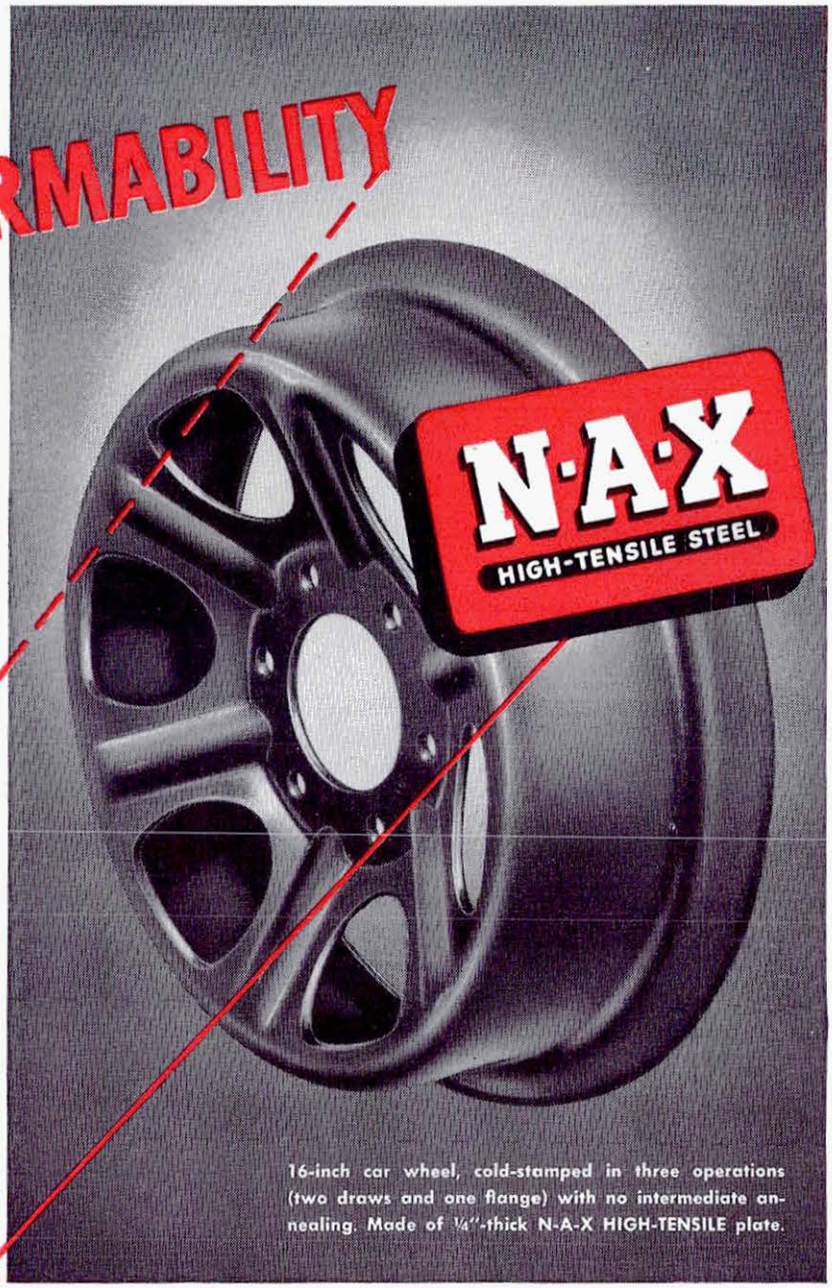


LOCOMOTIVE TIRES

EDGEWATER STEEL COMPANY · PITTSBURGH, PA.

Atlanta — Baltimore — Boston — Chicago — Cleveland — Kansas City — Louisville — New York
Philadelphia — St. Louis — St. Paul — San Francisco — Seattle — Washington, D. C.

EASY FORMABILITY



16-inch car wheel, cold-stamped in three operations (two draws and one flange) with no intermediate annealing. Made of ¼"-thick N-A-X HIGH-TENSILE plate.

N-A-X HIGH-TENSILE STEEL HAS ALL SIX — KEEPS ALL SIX

- HIGH STRENGTH
- EXCELLENT WELDABILITY
- HIGH FATIGUE-RESISTANCE
- GREAT IMPACT TOUGHNESS
- HIGH CORROSION-RESISTANCE

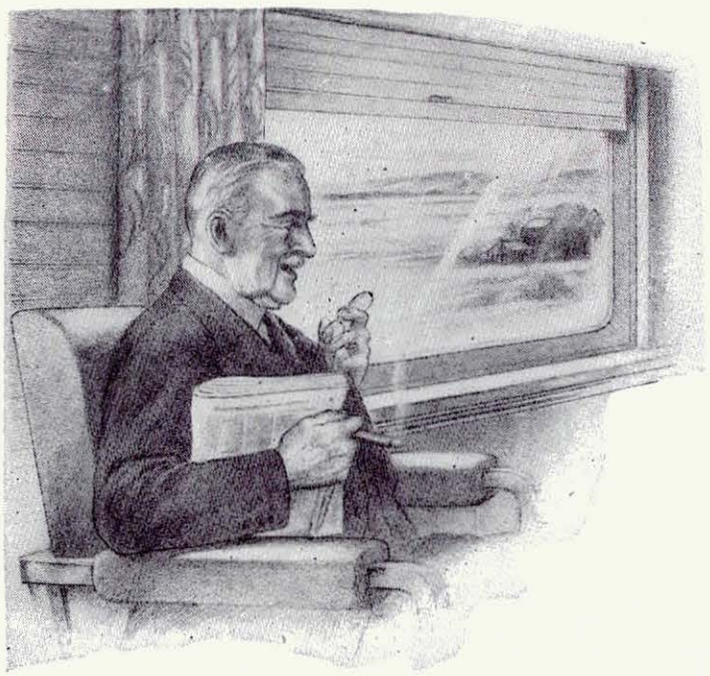
GREAT STEEL FROM GREAT LAKES

. . . WITHOUT LOSS OF OTHER CHARACTERISTICS

Because of an unusual combination of physical properties that are inherent in the steel, N-A-X HIGH-TENSILE will take deep and difficult cold forms *without losing other desirable characteristics.* It retains structural strength, impact toughness, fatigue-resistance, excellent weldability and high corrosion-resistance during and after production processes. It makes possible lighter, stronger, more durable parts and products, and greater economy in manufacturing. For better steel stampings, specify N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION



I Like Comfort, *says* *R. R. Rider*

(Number two of a series)

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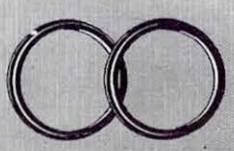
Edgewater

Serving America's Railroads

RING SPRING DRAFT GEARS

ROLLED STEEL WHEELS



LOCOMOTIVE TIRES

EDGEWATER STEEL COMPANY · PITTSBURGH, PA.

Atlanta — Baltimore — Boston — Chicago — Cleveland — Kansas City — Louisville — New York
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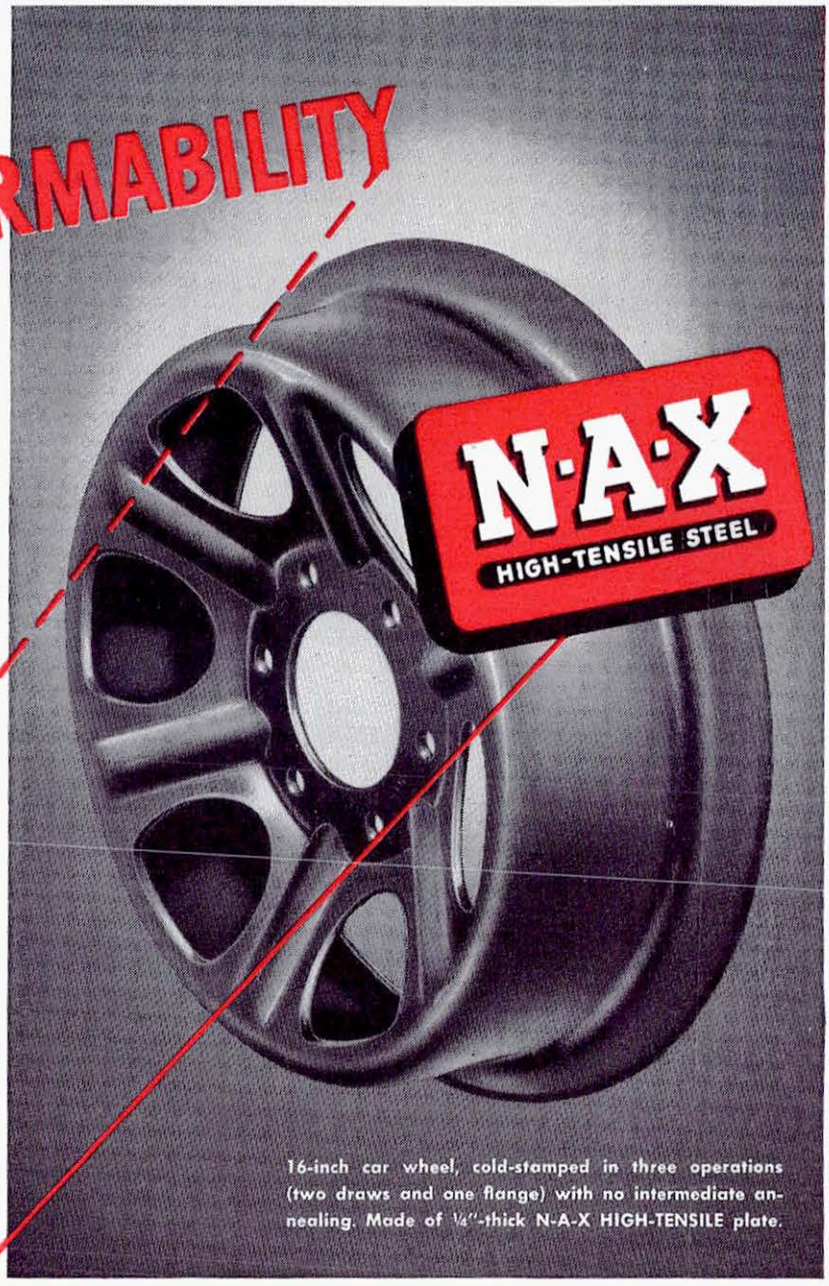
EASY FORMABILITY



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GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION

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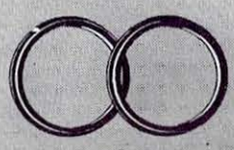

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EDGEWATER STEEL COMPANY · PITTSBURGH, PA.

Atlanta — Baltimore — Boston — Chicago — Cleveland — Kansas City — Louisville — New York
Philadelphia — St. Louis — St. Paul — San Francisco — Seattle — Washington, D. C.

On this memorable date,

it is a pleasure for

American Steel Foundries to

congratulate the Pennsylvania Railroad

on its one hundred years of service

to both American industry

and the public

★ ★ ★ ★ ★ ★ ★ ★ ★

The flanged wheel on the steel rail

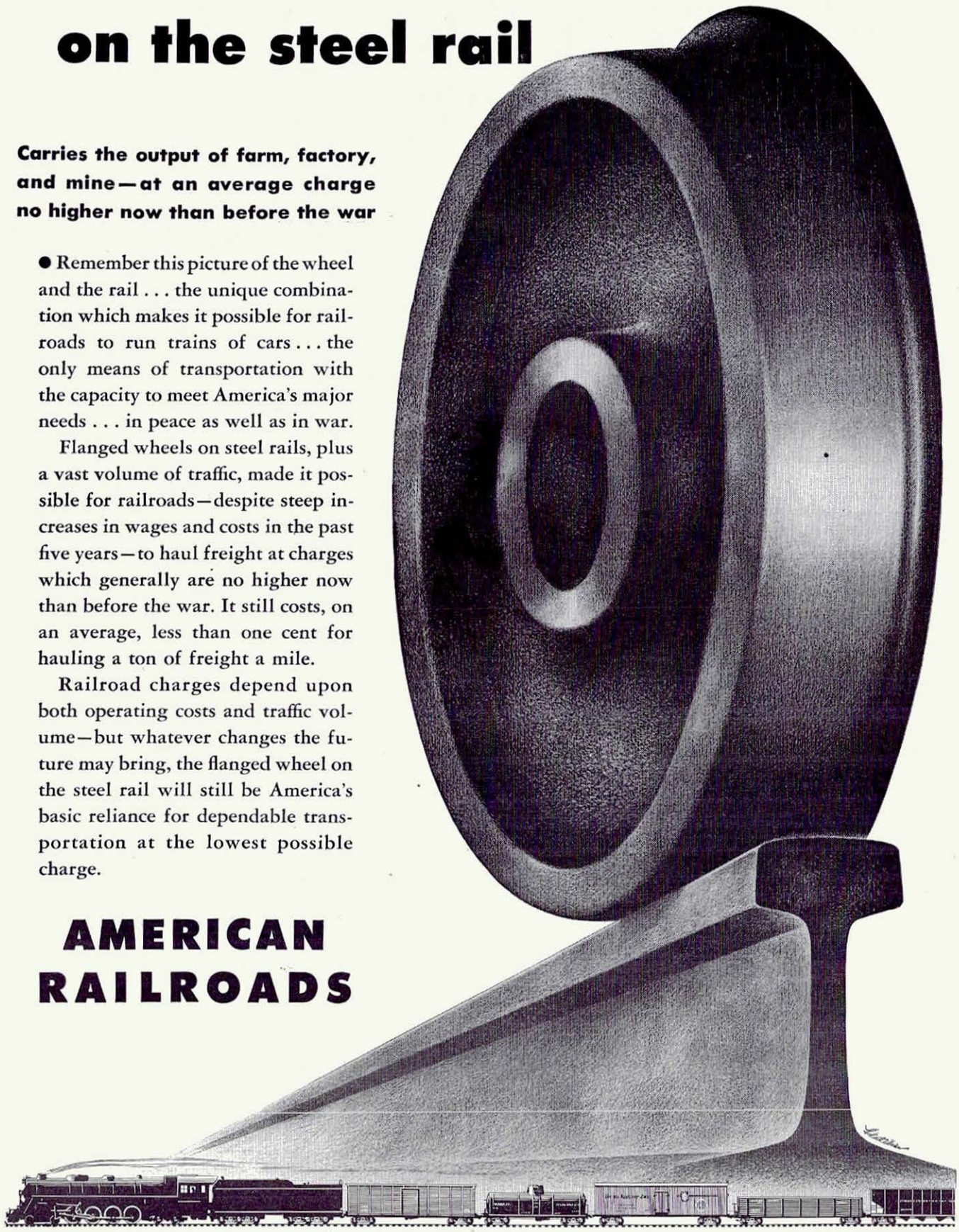
Carries the output of farm, factory, and mine—at an average charge no higher now than before the war

● Remember this picture of the wheel and the rail . . . the unique combination which makes it possible for railroads to run trains of cars . . . the only means of transportation with the capacity to meet America's major needs . . . in peace as well as in war.

Flanged wheels on steel rails, plus a vast volume of traffic, made it possible for railroads—despite steep increases in wages and costs in the past five years—to haul freight at charges which generally are no higher now than before the war. It still costs, on an average, less than one cent for hauling a ton of freight a mile.

Railroad charges depend upon both operating costs and traffic volume—but whatever changes the future may bring, the flanged wheel on the steel rail will still be America's basic reliance for dependable transportation at the lowest possible charge.

AMERICAN RAILROADS



There is no substitute for ANEMOSTAT air-diffusers in air-conditioned trains

During the last 25 years, close to one million (1,000,000) ANEMOSTAT draftless air-diffusers have been installed on heating, ventilating, and air-conditioning systems . . .

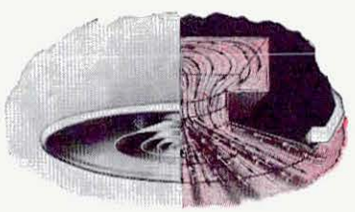
Long and hard-earned experience in installing these patented devices in railroad cars enables ANEMOSTAT engineers to provide constant equalization of temperature—*without drafts*—in air-conditioned trains.

Sleepers, diners, and coaches require individual air-diffusion patterns. Revolutionary changes in the structural design, interior decoration, and equipment of modern trains now make skillfully engineered air-diffuser installations more necessary than ever. And that is why there is no substitute for ANEMOSTAT air-diffusion.

Only an organization devoted exclusively to solving the intricate problems of air-diffusion—as ANEMOSTAT has been doing for over 25 years—can provide air-conditioned railroad cars with close temperature equalization and draft-free air.

ANEMOSTAT air-diffusers are already incorporated in the remodeled and new car designs of many leading railroads.

Write for complete details — today!



WHAT ANEMOSTATS DO TO CONDITIONED CAR-AIR

Due to its patented design, the ANEMOSTAT distributes air of any duct velocity in a multiplicity of planes traveling in all directions. Simultaneously, the unit creates a series of counter-currents which siphon *into the device* car-air equal to about 35% of the volume of supply-air. This car-air is mixed with the supply-air within the diffuser *before* the air-mixture is discharged into the car. The velocity of the discharged air is instantly reduced by air expansion within the ANEMOSTAT.

In this way, the ANEMOSTAT diffuses air of any duct velocity *noiselessly and evenly, thoroughly and draftlessly* throughout the car . . . closely equalizes temperature and humidity . . . and prevents air stratification.

Veteran-ize your personnel!

Many discharged war veterans received valuable technical and specialized training. Always consider veterans when you employ. They did their share —now let's all do ours!

ANEMOSTAT

REG. U.S. PAT. OFF.

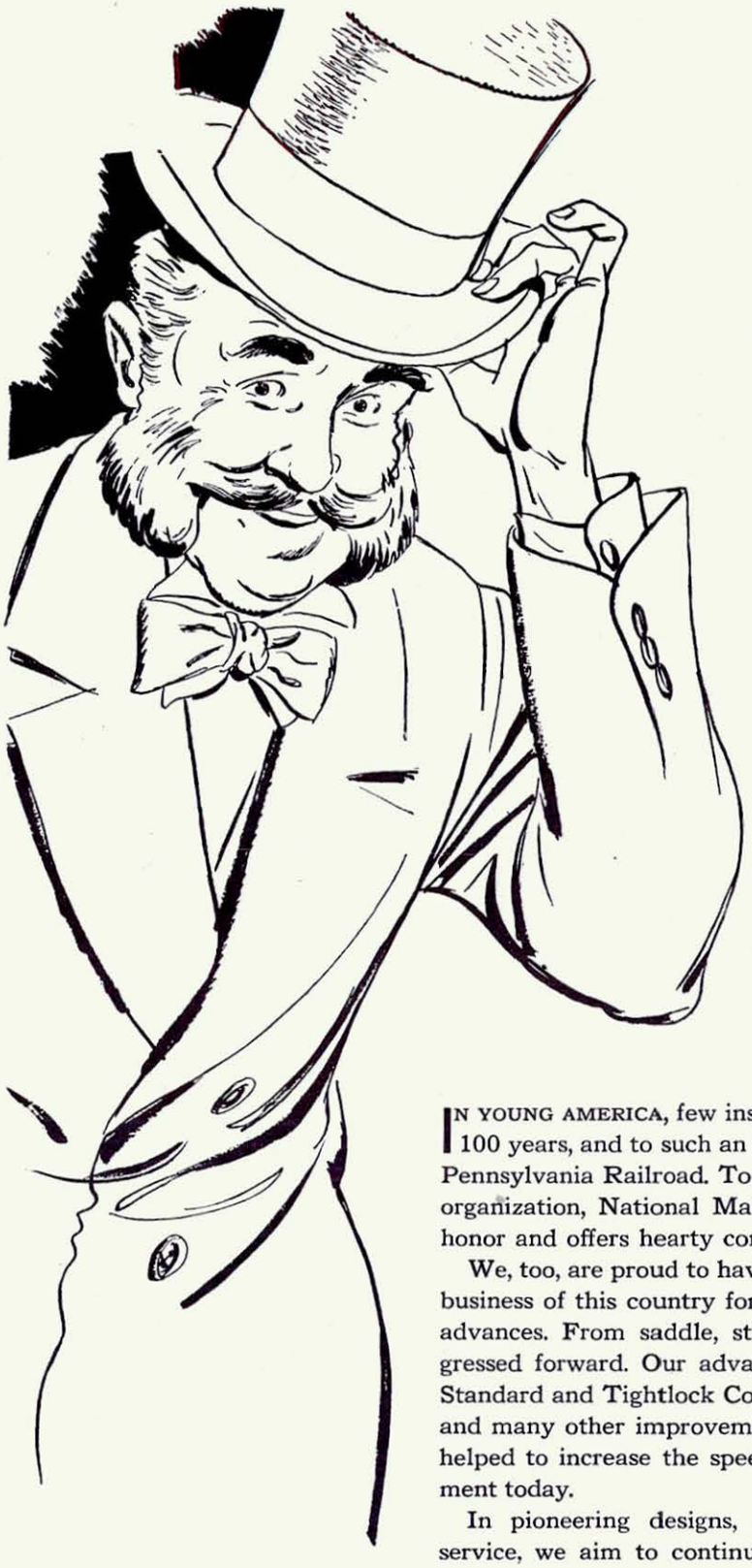
ANEMOSTAT CORPORATION OF AMERICA

10 EAST 39th STREET NEW YORK 16, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

AC-1049

"NO AIR-CONDITIONING SYSTEM IS BETTER THAN ITS AIR-DISTRIBUTION"



We tip our 78-year-old hat to the Pennsylvania

IN YOUNG AMERICA, few institutions can point to a continuous life of 100 years, and to such an outstanding record of progress, as can the Pennsylvania Railroad. To the century of achievement of this great organization, National Malleable & Steel Castings Company pays honor and offers hearty congratulations.

We, too, are proud to have been associated with the transportation business of this country for 78 years and to have contributed to its advances. From saddle, stage and wagon our products have progressed forward. Our advanced engineering developments, such as Standard and Tightlock Couplers, Draft Gears, Dual-Control Trucks and many other improvements in car and locomotive devices, have helped to increase the speed, safety and comfort of railroad movement today.

In pioneering designs, product quality, deliveries, prices and service, we aim to continue to merit your 78-year-old confidence.

M N & S Co

EST. 1868

NATIONAL MALLEABLE

& STEEL CASTINGS COMPANY

CLEVELAND, OHIO

Sales Offices: New York, Philadelphia, Chicago, Richmond, St. Louis, San Francisco
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Illinois

ONLY 3.8¢ PER MILE

operational cost in 3 years

As THE years enable long-range performance to provide the proof, amazing records of "Caterpillar" Diesel-powered 44-tonners' availability and operating and maintenance economy keep rolling in.

On the locomotive shown here, C. S. Christoffer, V. P. and G. M. of The Saint Paul Union Depot Company, reported, as of Oct. 11, 1945, these operational costs (which include labor and material):

Years	*Hours Operated*	*Cost Per Mile*
1942	5731	3.3c
1943	5479	4.3c
1944	5708	3.8c
	Total 16918	Average 3.8c

He adds, "In 1943 we performed some work on the 'Caterpillar' engine, and have had no repair expense on it since; and if we get through the year on the present basis, the operational cost will be comparable with the 1942 figures."

These figures speak for themselves — as do the cost and high-availability figures on all of the "Caterpillar" Diesel-powered units which constitute 90% of the 44-tonners in use on class roads throughout the Western Hemisphere.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

The discharged veteran wears this emblem. Remember his service and honor him.

CATERPILLAR REG. U.S. PAT. OFF. ***DIESEL ENGINES***

TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

IT'S AS PLEASANT AS A SPRING MORNING

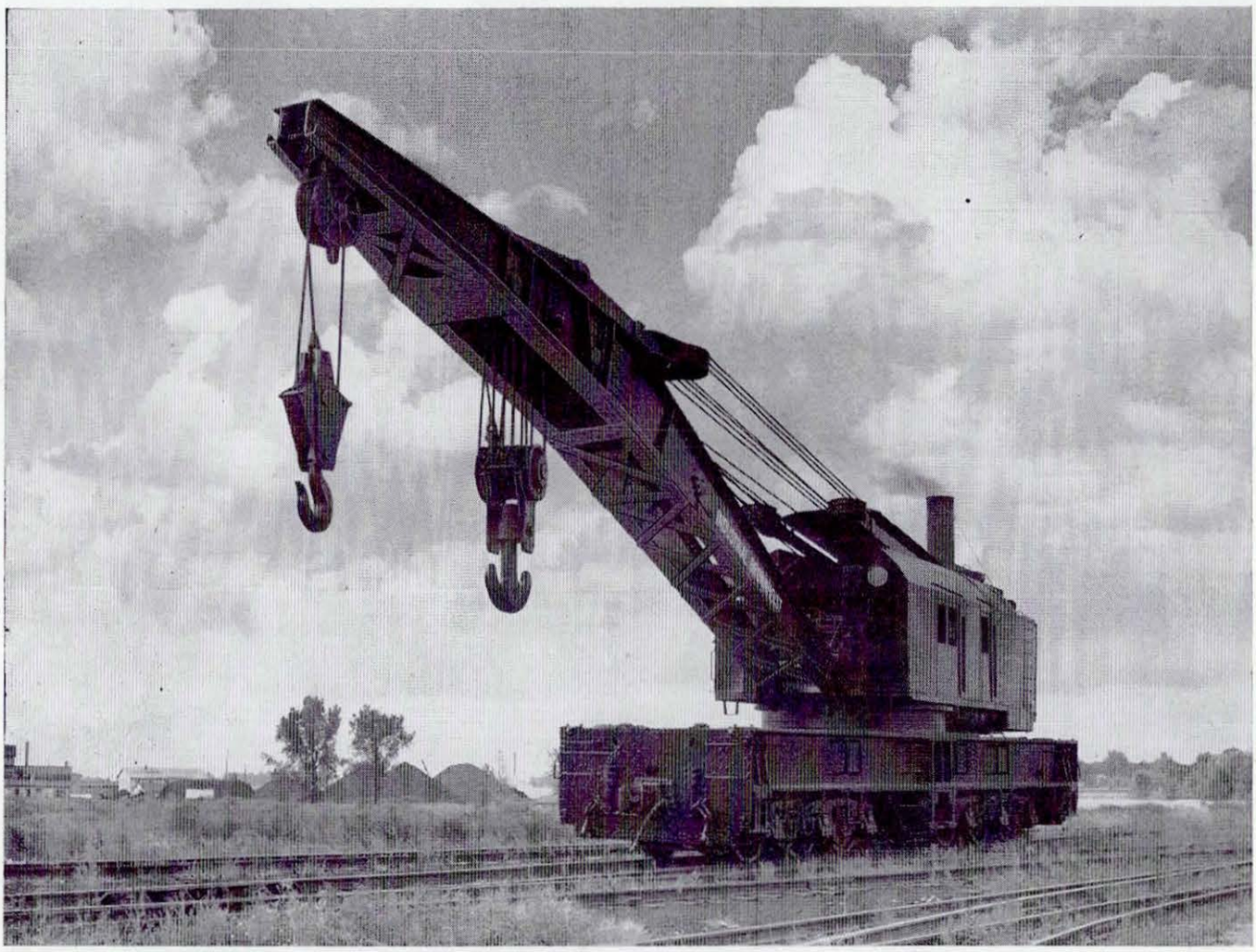
There's something about a one hundredth anniversary that's as pleasant as awakening on a fine spring morning. We know, because we had one of our own twenty years ago. And, for you of the Pennsylvania Railroad, we know there must be a very special thrill in this event. For you now look back on a record of achievement that has become part of the history of a great nation. So, on this occasion, we offer our very sincere congratulations. And we feel that we share a little in your satisfaction on this anniversary. For, during a large span of your hundred years, we have contributed in a very fundamental respect to the comfort of your passengers.

HEYWOOD-WAKEFIELD
EST. 1826

Transportation Seating Division *Gardner, Massachusetts*

Four NEW I. B. WRECKING CRANES HELP PENNSY CELEBRATE CENTENNIAL

As the Pennsylvania Railroad rolls into its second century of service to the nation, I.B. equipment will continue to contribute to the efficiency and dependability of that service. For example, the four I.B. wrecking cranes recently delivered to the Pennsylvania have the greatest lifting capacity of any materials-handling device of this type—250 tons! Special alloy steel boom allows longest reach with both main and auxiliary blocks ever designed into a railroad wrecking crane. Capacity 250-ton load is handled at 17′ 6″ from center of revolution, utilizing only 70 lbs. of 170 lbs. maximum steam pressure. Interconnected water tank system of approximately 1,000 gallon capacity assures longer service between refilling operations. All principal controls are air operated, excepting brakes which are manually controlled and safely lower capacity loads without use of engine. Liberal use of special alloy steel in vital subassemblies, including 12½ ton roller path between revolving upper works and car frame, assures complete dependability under heaviest loads and minimum maintenance and repair. For expert assistance on your materials handling problems, get complete facts from I.B.



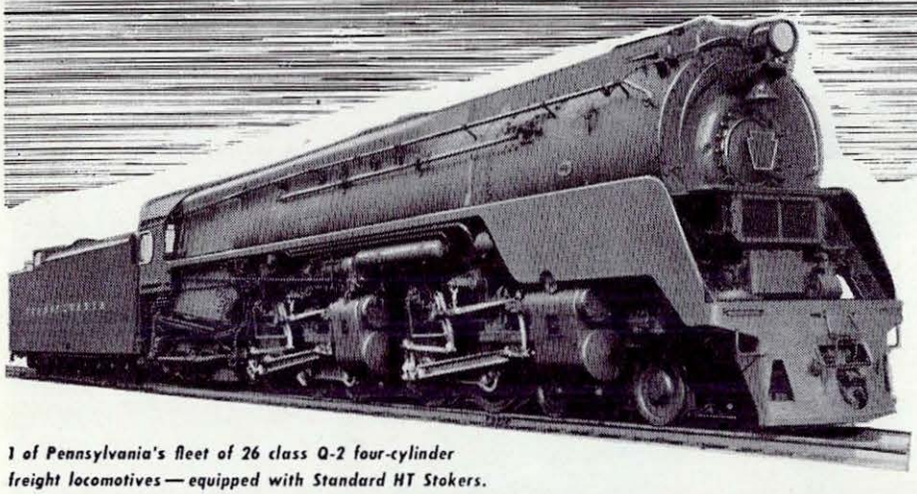
INDUSTRIAL BROWNHOIST BUILDS BETTER CRANES

INDUSTRIAL BROWNHOIST CORP. • BAY CITY, MICH • District Offices New York, Philadelphia, Cleveland, Chicago • Agencies: Detroit, Birmingham, Houston, Denver, Los Angeles, San Francisco, Seattle, Vancouver, B.C., Winnipeg, Canadian Brownhoist Ltd., Montreal, Quebec.

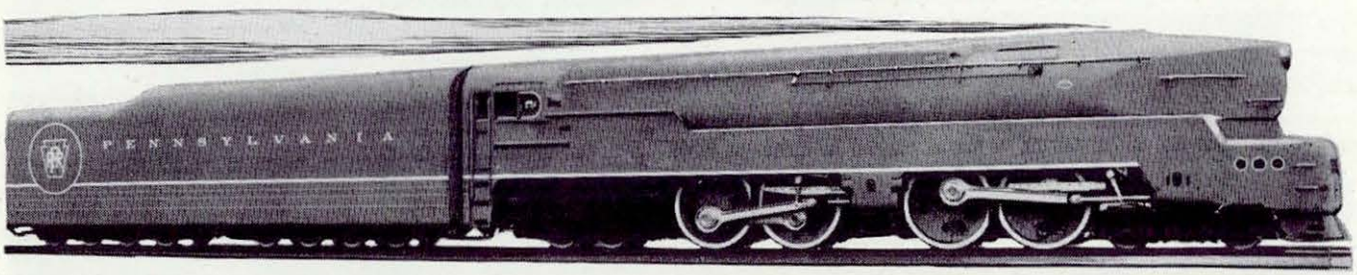
100 YEARS OF OPERATION—

1846 - 1946

CONGRATULATIONS *to the Pennsylvania on their 100th anniversary of railroad operation. To achieve such success is an important event in the history of any organization; it reflects sincerity of purpose in planning for the future while attaining and holding public confidence and esteem.*



1 of Pennsylvania's fleet of 26 class Q-2 four-cylinder freight locomotives — equipped with Standard HT Stokers.



1 of Pennsylvania's fleet of 52 Class T-1 four-cylinder passenger and freight locomotives — equipped with Standard HT Stokers.

THE STANDARD STOKER COMPANY, INC

NEW YORK • CHICAGO • ERIE • MONTREAL

SSC

REG. U.S. PAT. OFF.

"I FOUND a way to save $24,480.00 in my *Wastebasket*"

"Something caught my eye in the wastebasket . . . a trade journal I had flipped through and discarded. It was turned up to an ad which promised a 46% saving in material handling costs. When they talked about cutting my handling costs that much, well, I wanted to be shown.

"Literature told how this saving could be accomplished simply through the use of a bright, shiny orange and black electric truck called 'Transporter' . . . the miracle truck that lightens life's loads. It was an impressive story. As a result I ordered one, and an A.T.C. Specialist showed up with it to demonstrate what they claimed.

"He piled 6000 pounds of our most unwieldy product on it. Then asked for one of our stenographers . . . and she promptly walked off with the load as easy as she'd powder her nose. Her thumb pressed a button, her hand gently guided it. That's all there was to it. Husky truckers accustomed to a three-man operation moving similar loads were amazed . . . couldn't wait to try this wonder truck that meant for them an end to back-breaking, gruelling toil.

"I was more than sold on Automatic Transporters. They have cut our material handling costs 46% . . . a solid $24,480.00 saved*—the equivalent of $244,800.00 worth of increased volume on a 10% profit basis. That's the money-saving, profit-making opportunity I found in my wastebasket."

Such savings may be duplicated many times over during the life of Transporters . . . may be multiplied many times depending on the size of your material handling operation. Mail the coupon for complete facts.

Remember: Only AUTOMATIC Makes the TRANSPORTER

Transporter
A PRODUCT OF AUTOMATIC
Lightens LIFE'S LOADS

**Case 10 in "Automatic Savings Parade"*

AUTOMATIC TRANSPORTATION COMPANY
Div. of The Yale & Towne Mfg. Co.
51 West 87th Street, Dept. D, Chicago 20, Ill.

Please mail me, without cost or obligation, complete facts about AUTOMATIC TRANSPORTER, the miracle electric truck . . . plus *proof* that it has cut handling costs in half.

☐ Have an A.T.C. Material Handling Specialist call.

Company Name.....

By.....*Position*.....

Street Address.....

City.....*State*.....

HAJOCA *Salutes*

THE PENNSYLVANIA RAILROAD COMPANY

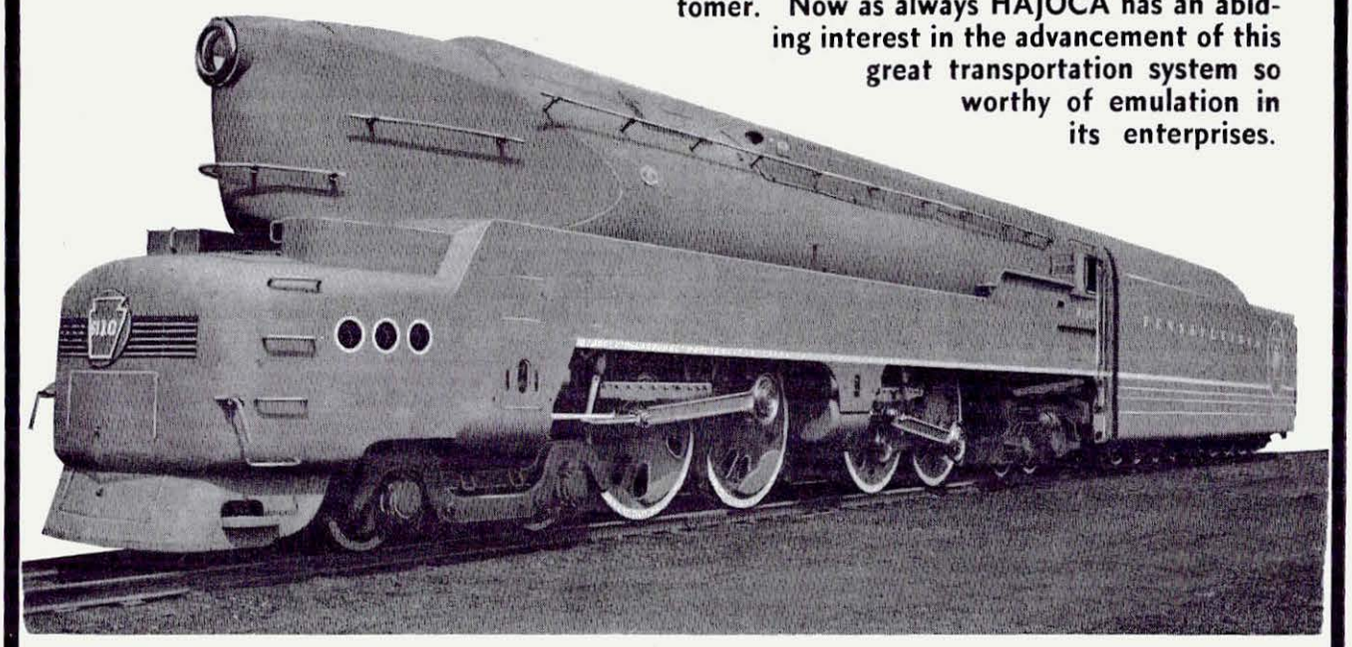
on this anniversary

THIS centennial is an occasion for national felicitation. Throughout these one hundred years the growth of the Pennsylvania Railroad has freshened American Industry at its very roots. The System's high standards for rolling stock and structures have combined to produce global leadership in Transportation.

The Pennsylvania's services in prosperous times to Agriculture, Mines, Steel, Industry, Travel and the Investing Public have been exceeded only by its renowned services to a grateful nation in times of war and national distress.

Its achievements over the last century in the science of railroading have been fitting rewards for the company's farsightedness and research. Its popular trains symbolize to an appreciative public one of the yardsticks of national culture.

Throughout 88 of the Pennsylvania Railroad Company's 100 years of progress and attainments HAJOCA CORPORATION is proud to have served such a distinguished customer. Now as always HAJOCA has an abiding interest in the advancement of this great transportation system so worthy of emulation in its enterprises.



HAJOCA CORPORATION

Manufacturers and Distributors

Industrial Supplies—Plumbing and Heating Equipment

Philadelphia, Pa.

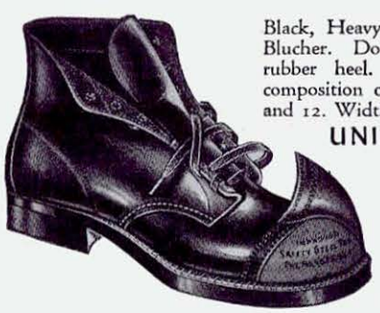
31 Branches Serving the Eastern Seaboard

STOP
LOOK
LISTEN

On some twenty-three railroads in the United States our steel toe safety shoes can be purchased in the railroads' company stores on a pay roll deduction plan. If the railroad where you are employed is one of those having our service, you will find the right shoe for your job made of the right materials to give WEAR and also a correct fit to give COMFORT. Ask your nearest Railroad Stores Department for information.

Shoes for TRACKMEN — WAREHOUSEMEN — SHOPMEN — TRAINMEN — FOREMEN

HEAVY OUTSIDE WORK



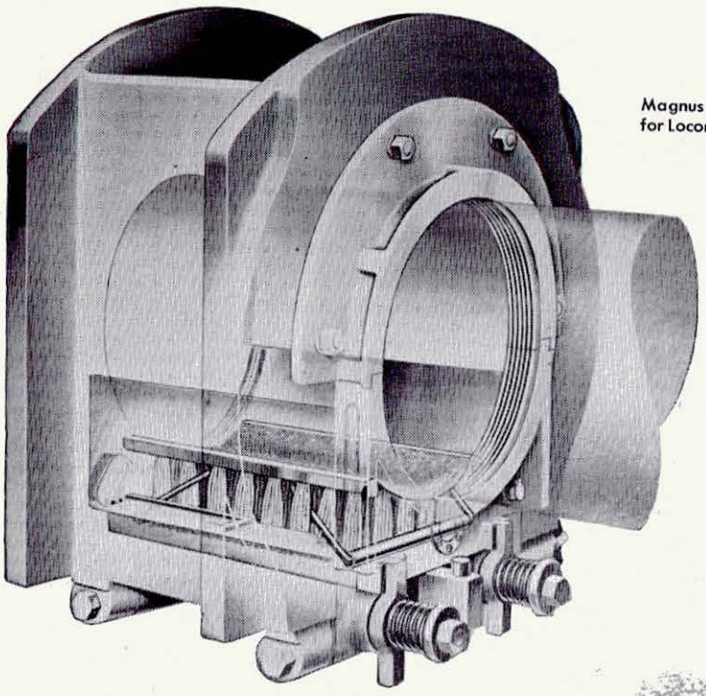
Black, Heavy, Work-Shoe Leather Blucher. Double leather outsole, rubber heel. Also available with composition outsole. Sizes 5 to 11 and 12. Widths D, EE.

UNION MADE

Safety First SHOE COMPANY

HOLLISTON, MASSACHUSETTS

Makers of Industrial Shoes for a Half Century

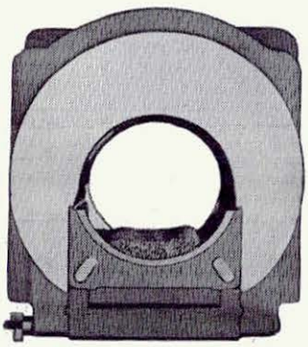


Magnus Oil Lubricator
for Locomotive Journals

Light Viscosity Oil Lubrication

Increases Journal Bearing Life!

Magnus Locomotive Journal Oil Lubricator, utilizing *light viscosity* oil, increases the life of both journal bearings and lateral facings as much as three to five times. As a result, road mileage between classified repairs is approximately doubled, quicker servicing lessens turn-around time, and shopping costs are greatly reduced.



Magnus Satco-Lined Lateral Hub Facing for engine-truck, trailer and driving boxes

SATCO Bearing Metal

MODERN
HEAVY DUTY
BEARINGS

MAGNUS METAL CORPORATION
CHICAGO NEW YORK

STOP

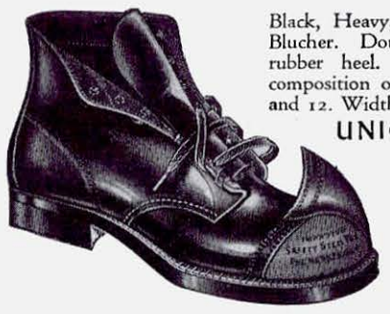
LOOK

LISTEN

On some twenty-three railroads in the United States our steel toe safety shoes can be purchased in the railroads' company stores on a pay roll deduction plan. If the railroad where you are employed is one of those having our service, you will find the right shoe for your job made of the right materials to give WEAR and also a correct fit to give COMFORT. Ask your nearest Railroad Stores Department for information.

***Shoes for* TRACKMEN — WAREHOUSEMEN — SHOPMEN — TRAINMEN — FOREMEN**

HEAVY OUTSIDE WORK



Black, Heavy, Work-Shoe Leather Blucher. Double leather outsole, rubber heel. Also available with composition outsole. Sizes 5 to 11 and 12. Widths D, EE.

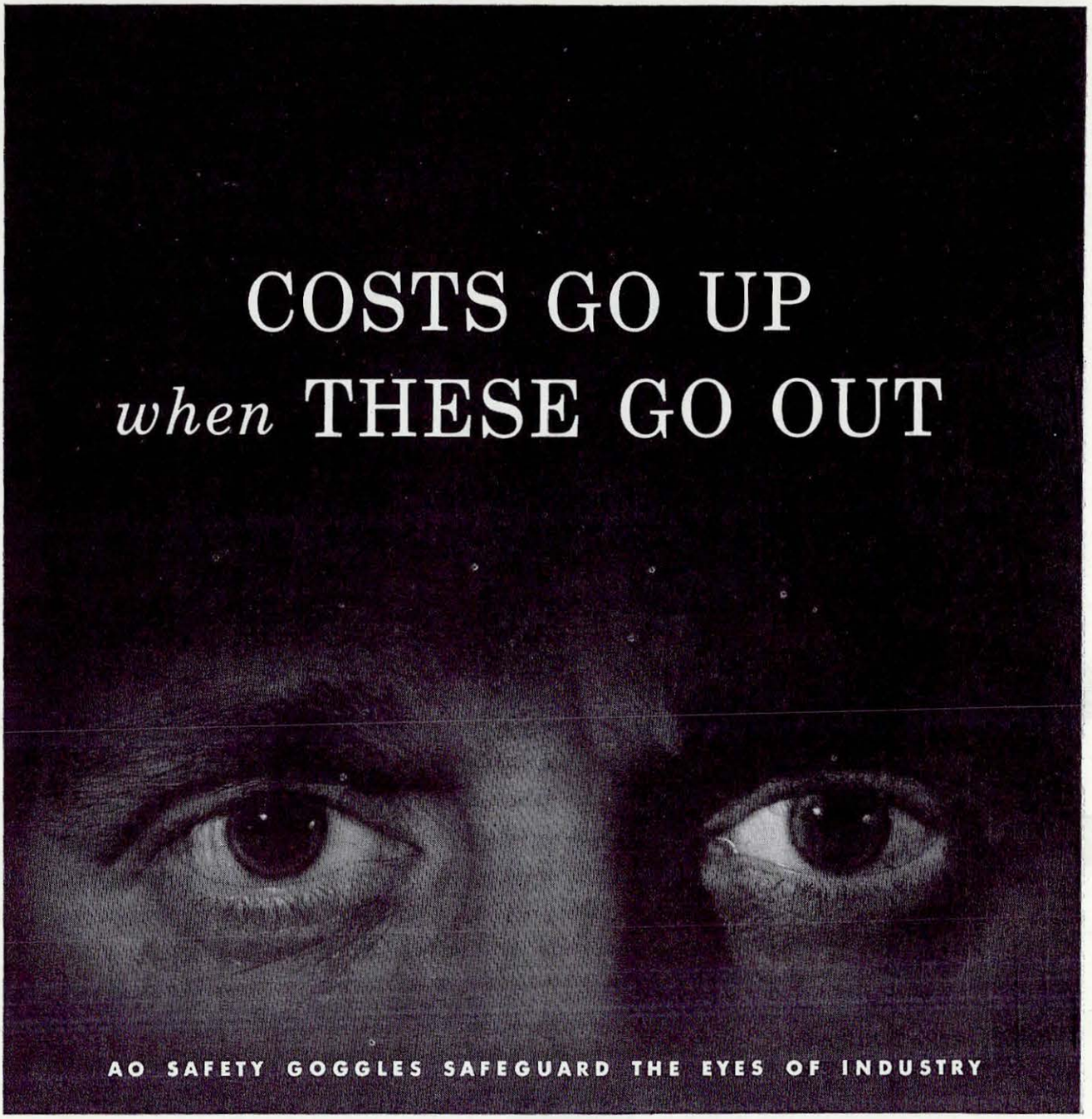
UNION MADE

Safety First SHOE COMPANY

HOLLISTON, MASSACHUSETTS

Makers of Industrial Shoes for a Half Century

COSTS GO UP *when* THESE GO OUT



EYES are *expensive* targets, for a single eye injury can cost more than $1000 in compensation and medical care.

Perhaps your plant has never had to pay a four-figure claim. Yet — unless you have an adequate eye protection program — so called minor eye accidents are probably adding materially to your costs. (It is estimated by the Society for the Prevention of Blindness that eye injury costs average *$5.00 per shop worker per year.*)

Ninety-eight per cent of eye accidents are preventable — by providing your workers with properly designed safety goggles — at a cost of only about $1.50 per worker. Why not let your nearest AO Safety Representative help you work out the details for a real eye protection program *now?*

American Optical

COMPANY

SOUTHBRIDGE, MASSACHUSETTS

Safety Division

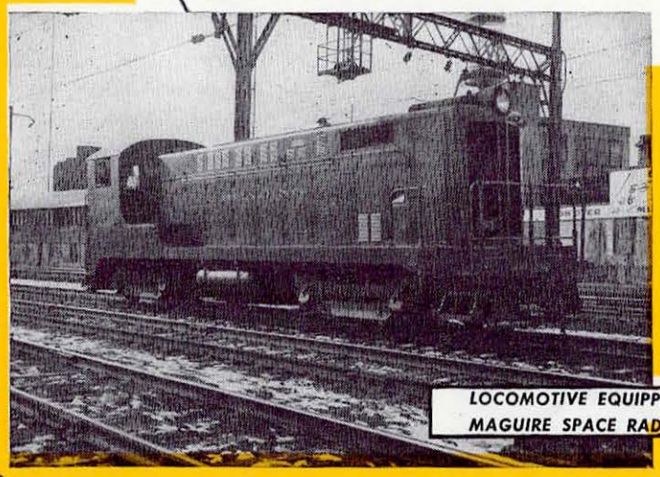
MAGUIRE CUSTOM-ENGINEERED RAILROAD RADIO —

REMOTE STATION

This new complete V. H. F. system of yard communication has definitely proven its value in actual twenty-four hour tests conducted over the lines of the Reading Railroad.

In conducting these tests, five diesel electric locomotives were tied-in, by means of two-way radio telephone equipment, with a fixed station located in the yardmaster's office. This fixed station, equipped with automatic voice recorder, is connected by telephone circuits with two remote stations, which are, in turn, able to contact the locomotives via this equipment.

For more detailed information on this new-type equipment write to Maguire Industries, Electronics Division at the address below.

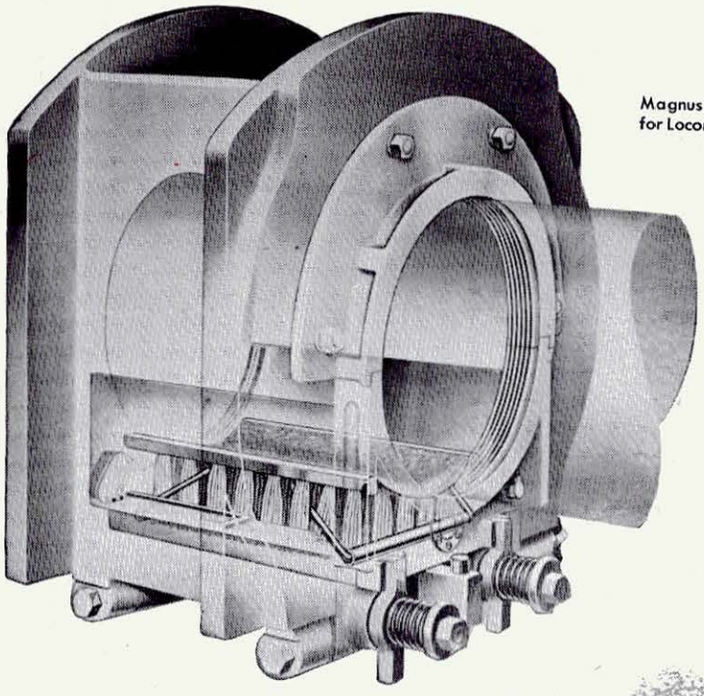


LOCOMOTIVE EQUIPPED WITH MAGUIRE SPACE RADIO

ELECTRONICS DIVISION

MAGUIRE INDUSTRIES, INCORPORATED

1437 RAILROAD AVENUE • BRIDGEPORT, CONN.

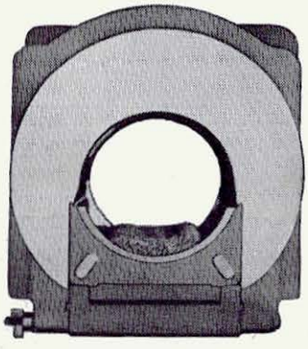


Magnus Oil Lubricator
for Locomotive Journals

Light Viscosity Oil Lubrication

Increases Journal Bearing Life!

Magnus Locomotive Journal Oil Lubricator, utilizing *light viscosity* oil, increases the life of both journal bearings and lateral facings as much as three to five times. As a result, road mileage between classified repairs is approximately doubled, quicker servicing lessens turn-around time, and shopping costs are greatly reduced.



Magnus Satco-Lined Lateral Hub Facing for engine-truck, trailer and driving boxes

SATCO Bearing Metal

MODERN
HEAVY DUTY
BEARINGS

MAGNUS METAL CORPORATION
CHICAGO NEW YORK

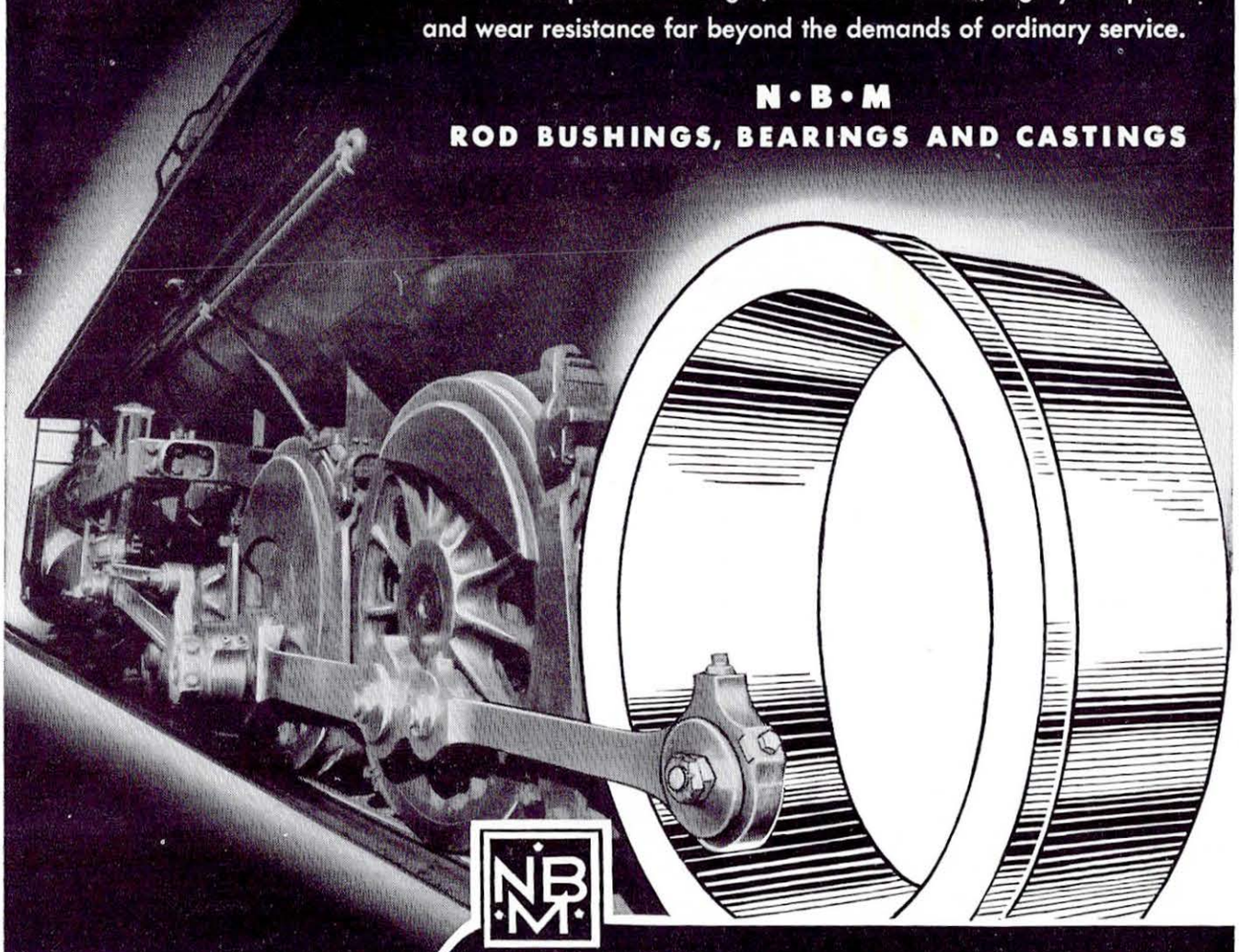
DREAM OF A SHOP SUPERINTENDENT WHO WANTED EVER-LASTING ROD BUSHINGS

He was tired of the frequent lay-offs for bushing replacement.

N-B-M Rod Bushings come as closely to the fulfillment of this dream as humanly possible.

Their special alloys and fine-grained structure provide tensile and compressive strength, Brinnell hardness, high yield point and wear resistance far beyond the demands of ordinary service.

N • B • M
ROD BUSHINGS, BEARINGS AND CASTINGS



N·B·M
NATIONAL BEARING
DIVISION
ST. LOUIS • NEW YORK

AMERICAN Brake Shoe COMPANY

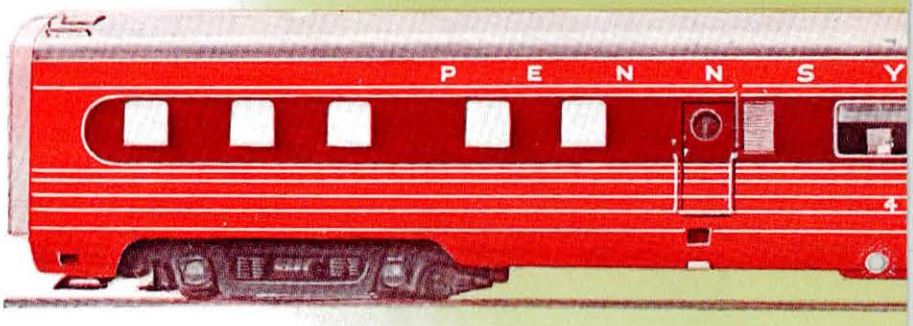
PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

Happy

AND MANY MORE TO COME

a.c.f. can think of no more appropriate expression to greet THE PENNSYLVANIA RAILROAD on its One Hundredth Anniversary than the sturdy old toast—"Happy Birthday!"

Down the line together during The Pennsylvania Railroad's one hundred years, through good times and bad, in war and in peace, a.c.f. and its



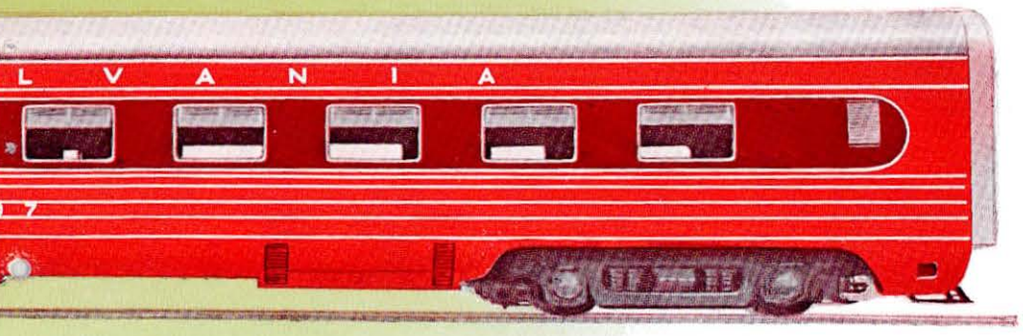
a.c.f.

Birthday!

predecessor companies have supplied this famous railroad with many items of sound and solid railroad equipment, and is so doing at present.

Like the Pennsylvania, ACF has faith in the future of America's Railroads. Like the Pennsylvania, ACF is convinced that PROGRESS TRAVELS BY RAIL!

"QUALITY AND VISION IN TRANSPORTATION"



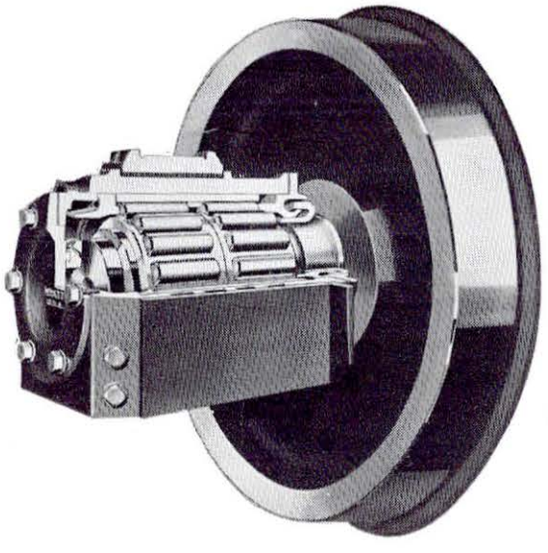
AMERICAN CAR AND FOUNDRY COMPANY

NEW YORK • CHICAGO • ST. LOUIS • CLEVELAND • WASHINGTON
PHILADELPHIA • PITTSBURGH • ST. PAUL • SAN FRANCISCO

The PENNSYLVANIA said: OK

IN addition to the new equipment listed opposite, the Pennsylvania has in service approximately 2,000 Hyatt equipped journal boxes which have proven their dependability. With the Pennsylvania, therefore, the specification of Hyatt Roller Bearing Journal Boxes is based on sound judgment plus favorable experience.

Thus, are we proud to share in the progress of this great railroad which is now celebrating its centennial. Hyatt Bearings Division—General Motors Corporation, Harrison, New Jersey.



OK

—*"Put Hyatt Roller Bearing Journal Boxes on the following passenger equipment cars":*

12 CARS	In the Seaboard Air Line—Richmond, Fredericksburg & Potomac & Pennsylvania Pool
10 CARS	On the Long Island Rail Road
10 CARS	In the Atlantic Coast Line—Florida East Coast—Richmond, Fredericksburg & Potomac—and Pennsylvania Pool
57 CARS	To be built by the American Car and Foundry Company for The Pennsylvania Railroad

HYATT ROLLER BEARING RAILROAD JOURNAL BOXES

PENNSYLVANIA'S

100th year IS JUST A MILEPOST

Magnificent as is its century-long record, the Pennsylvania Railroad's hundredth year will be only a milepost along the route of greater development.

Looking back on past achievements, and ahead to the progress that is already on the way, every man and woman who wears the Pennsylvania's keystone symbol of service has a right to feel a warm pride as the hundred-year milepost swings by.

ALUMINUM COMPANY OF AMERICA, 2178 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN ALUMINUM

REG. T. M.

ALCOA ALUMINUM

WOVENSTONE
INSUTAPE
TEAM
COPYRIGHT 1945
ARMY
ARMY
NAVY

MATES!

INSUTAPE and WOVENSTONE save fuel and eliminate maintenance problems. Their high insulating efficiency means greater passenger comfort, too.

Here are the reasons:

Unarco steam-pipe insulations prevent pipes from freezing—keep steam coursing through the train at peak-efficiency; will not shake down—always remain snug and firm against the pipe—can be reapplied over and over again.

. . . And here's the proof:

Operating tests prove that Insutape eliminates 64% of bare pipe heat losses. Savings have been proved under still air conditions, but are much greater under wind velocity conditions found in the actual operation of rolling stock.

Wovenstone has proved its efficiency in 12 years of "active service." Many mechanical men can point with pride to rolling stock that is still equipped with its original Wovenstone—rolling stock placed in service over 12 years ago!

UNION ASBESTOS

MEANS PROGRESS IN INSULATION

AND RUBBER CO.

310 S. MICHIGAN AVE. CHICAGO 4, ILLINOIS

NEW YORK SAN FRANCISCO

Great things are happening on the

FRISCO LINES

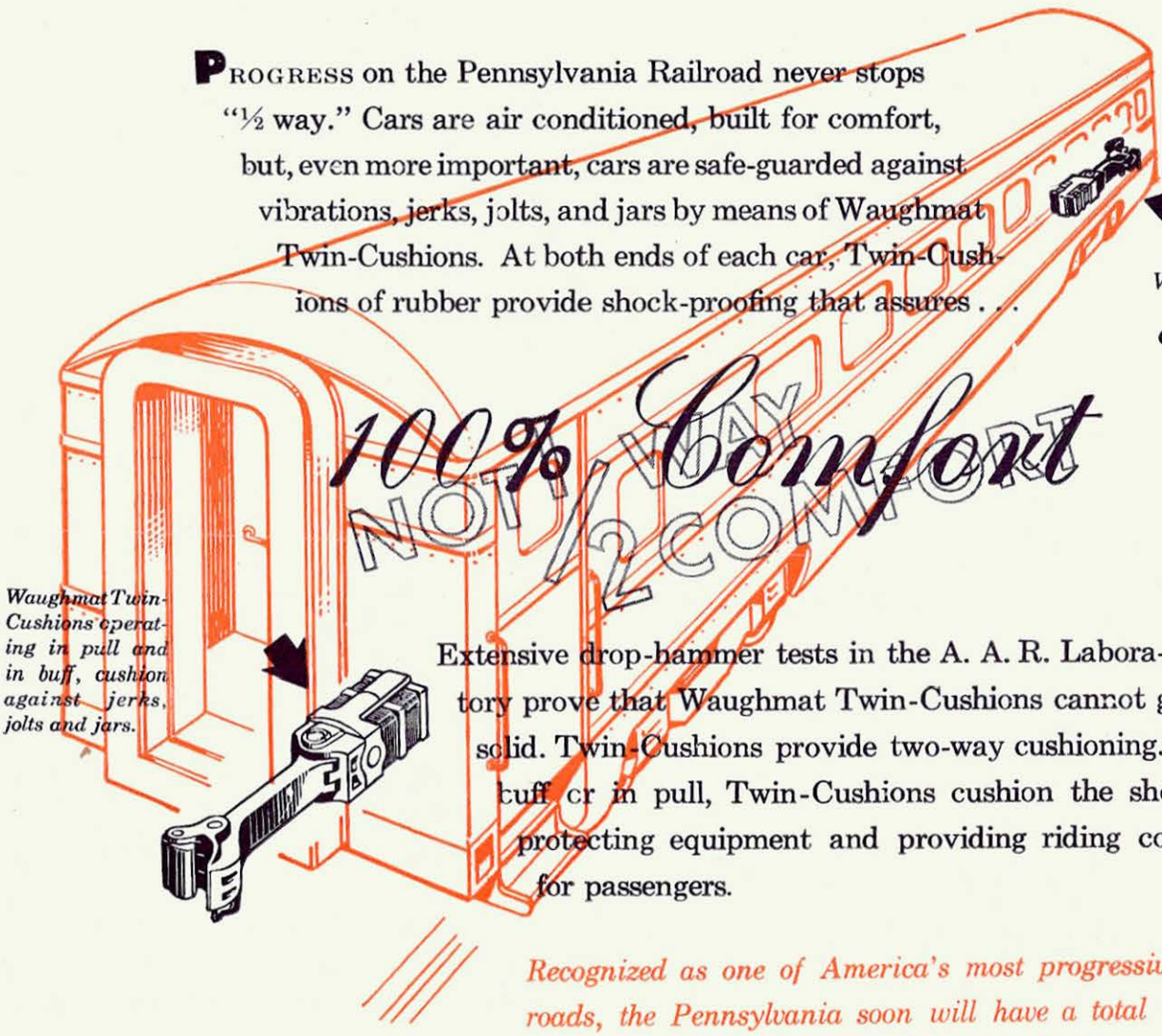
ST. LOUIS-SAN FRANCISCO RY.

Sensational new freight schedules cut shipping time up to 24 hours! These *plus* time-saving loading innovations, *plus* 600 new freight cars of revolutionary design, are making Frisco Faster Freight *faster* than ever before! For the finest in dependable freight service and luxurious passenger travel... look to Frisco!

It's a Great Railroad

Why The PENNSYLVANIA RAILROAD BLUE RIBBON TRAINS ride so smoothly

PROGRESS on the Pennsylvania Railroad never stops "½ way." Cars are air conditioned, built for comfort, but, even more important, cars are safe-guarded against vibrations, jerks, jolts, and jars by means of Waughmat Twin-Cushions. At both ends of each car, Twin-Cushions of rubber provide shock-proofing that assures . . .



Waughmat Twin-Cushions.

Waughmat Twin-Cushions operating in pull and in buff, cushion against jerks, jolts and jars.

Extensive drop-hammer tests in the A. A. R. Laboratory prove that Waughmat Twin-Cushions cannot go solid. Twin-Cushions provide two-way cushioning. In buff or in pull, Twin-Cushions cushion the shocks, protecting equipment and providing riding comfort for passengers.

Recognized as one of America's most progressive railroads, the Pennsylvania soon will have a total of 546 passenger cars Twin-Cushion Equipped.

WAUGHMAT ★ *Twin Cushions*

ELIMINATE JERKS AND JARS

★ **CAN BE APPLIED TO OLD OR NEW CARS**

WAUGH EQUIPMENT COMPANY, New York • Chicago • St. Louis • Canadian Waugh Equipment Company: Montreal

A MILESTONE IN RAILROAD RADIO!

"Modern railroad transportation systems cannot function to their maximum efficiencies without the use of modern communications networks. That is why the Santa Fe System maintains complete telephone and teletype, as well as telegraph systems along its entire thirteen-thousand-mile right-of-way. It is also the reason for Santa Fe's immediate and careful exploration of all new communications techniques, such as railroad radio, and accounts for the many 'firsts' contributed by the Santa Fe to the railroad communications art."

President
Atchison, Topeka and Santa Fe Railway

AM or FM? Which to use on railroad radio? This question has long troubled engineers in both the railroad and the radio fields.

To determine the comparative operating characteristics of AM and FM radio equipment, The Atchison, Topeka and Santa Fe Railway, in conjunction with the Farnsworth Television & Radio Corporation, recently conducted an exhaustive series of tests.

As a result, railway men the nation over have for the first time a thorough evaluation of both types of modulation for railroad service. Of equal importance is the fact that the information derived now enables Farnsworth to design better railroad radio equipment. Efficiency will be increased; the way has been opened to reductions in purchase price and maintenance cost.

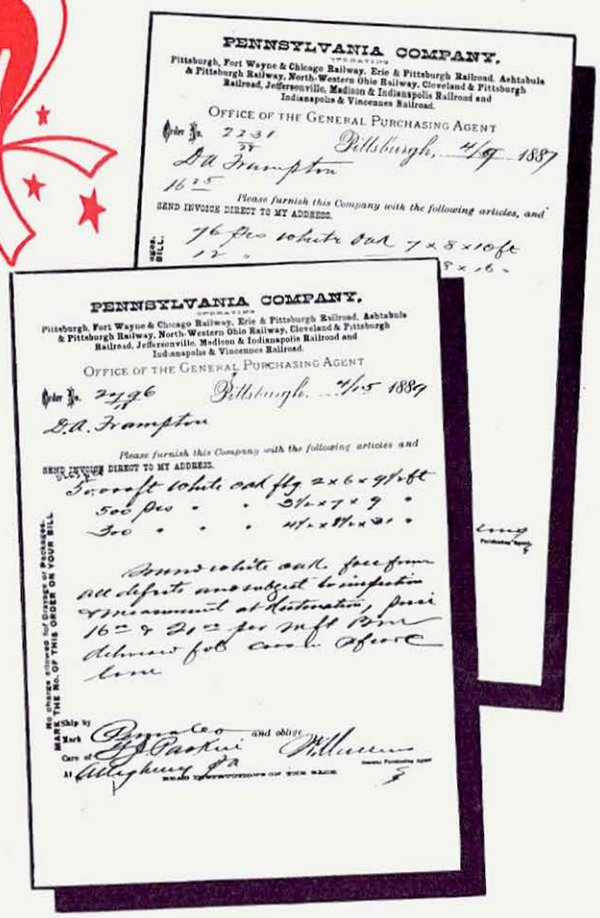
Such tests add one more milestone to the development of railroad communications. The engineers of Farnsworth's Mobile Communications Division have pioneered many other important achievements. Backed by Farnsworth's ample production facilities, these engineers are now prepared to offer practical radio assistance to all the railroads of America.

The Farnsworth Television & Radio Corporation, Dept. RA-2, Ft. Wayne 1, Indiana.

FARNSWORTH TELEVISION & RADIO CORPORATION

Farnsworth Radio and Television Receivers and Transmitters • Aircraft Radio Equipment • Farnsworth Television Tubes • Halstead Mobile Communications and Traffic Control Systems for Rail and Highway • the Farnsworth Phonograph-Radio • the Capehart • the Panamuse by Capehart

Congratulations TO THE PENNSYLVANIA RAILROAD UPON THEIR 100th Anniversary!


PENNSYLVANIA COMPANY.

Pittsburgh, Fort Wayne & Chicago Railway, Erie & Pittsburgh Railroad, Ashtabula & Pittsburgh Railway, North-Western Ohio Railway, Cleveland & Pittsburgh Railroad, Jeffersonville, Madison & Indianapolis Railroad and Indianapolis & Vincennes Railroad.

OFFICE OF THE GENERAL PURCHASING AGENT

Order No. 2231 Pittsburgh, 11/9 1887

D.B. Frampton

16 25

Please furnish this Company with the following articles, and SEND INVOICE DIRECT TO MY ADDRESS.

76 pcs white oak 7 x 8 x 10 ft

12 " " 8 x 16 "

PENNSYLVANIA COMPANY.

Pittsburgh, Fort Wayne & Chicago Railway, Erie & Pittsburgh Railroad, Ashtabula & Pittsburgh Railway, North-Western Ohio Railway, Cleveland & Pittsburgh Railroad, Jeffersonville, Madison & Indianapolis Railroad and Indianapolis & Vincennes Railroad.

OFFICE OF THE GENERAL PURCHASING AGENT

Order No. 2296 Pittsburgh, 11/5 1887

D.B. Frampton

Please furnish this Company with the following articles and SEND INVOICE DIRECT TO MY ADDRESS.

Send Invoice direct to my address.

50 pcs white oak ties 8 x 6 x 9 ft 6 in

500 pcs " " 8 1/2 x 7 x 9 "

300 " " " 11 x 11 1/2 x 9 1/2 "

Same white oak ties from all depots and subject to inspection & measurement at destination, paid 16 1/2 & 21 1/2 per M ft B.M. delivered f.o.b. cars Osborne Line

Re-Ship by

Mark

Care of

At Allegheny, Pa.

and obliged

Pittsburgh

MARK THIS NO. OF THIS ORDER ON YOUR BILL

Pennsylvania purchase orders of 60-odd years ago—fulfilled promptly with the Frampton service that is our special pride today.

THE FRAMPTON COMPANY and subsidiaries are proud indeed to have served the PENNSYLVANIA for over 60 years!

Now, as then, FRAMPTON is supplying not only the PENNSYLVANIA, but also America's other leading railways with cross ties, switch ties, bridge ties, tie plugs, piling, plank and many other dependable FRAMPTON quality forest products.

NOTE OUR NEW ADDRESS

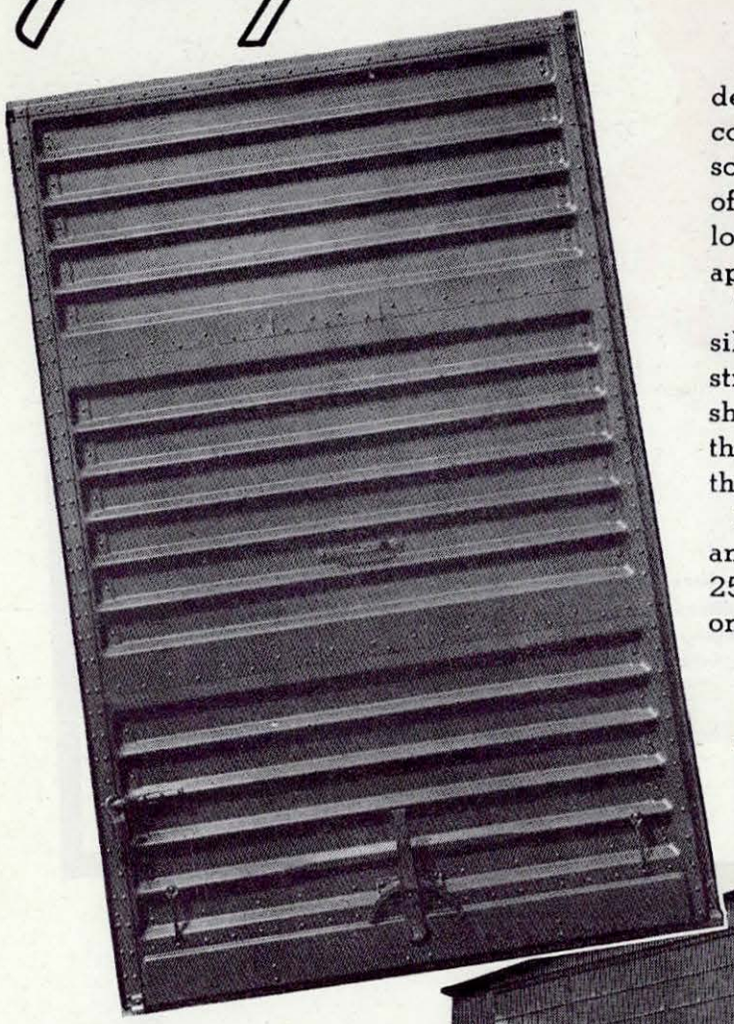
D. B. FRAMPTON & COMPANY

and Subsidiaries

THE BAKER WOOD PRESERVING CO. TIE PLUGS, INC.

HUNTINGTON NATIONAL BANK BUILDING · COLUMBUS, OHIO

Yoloy...door to today's modernization

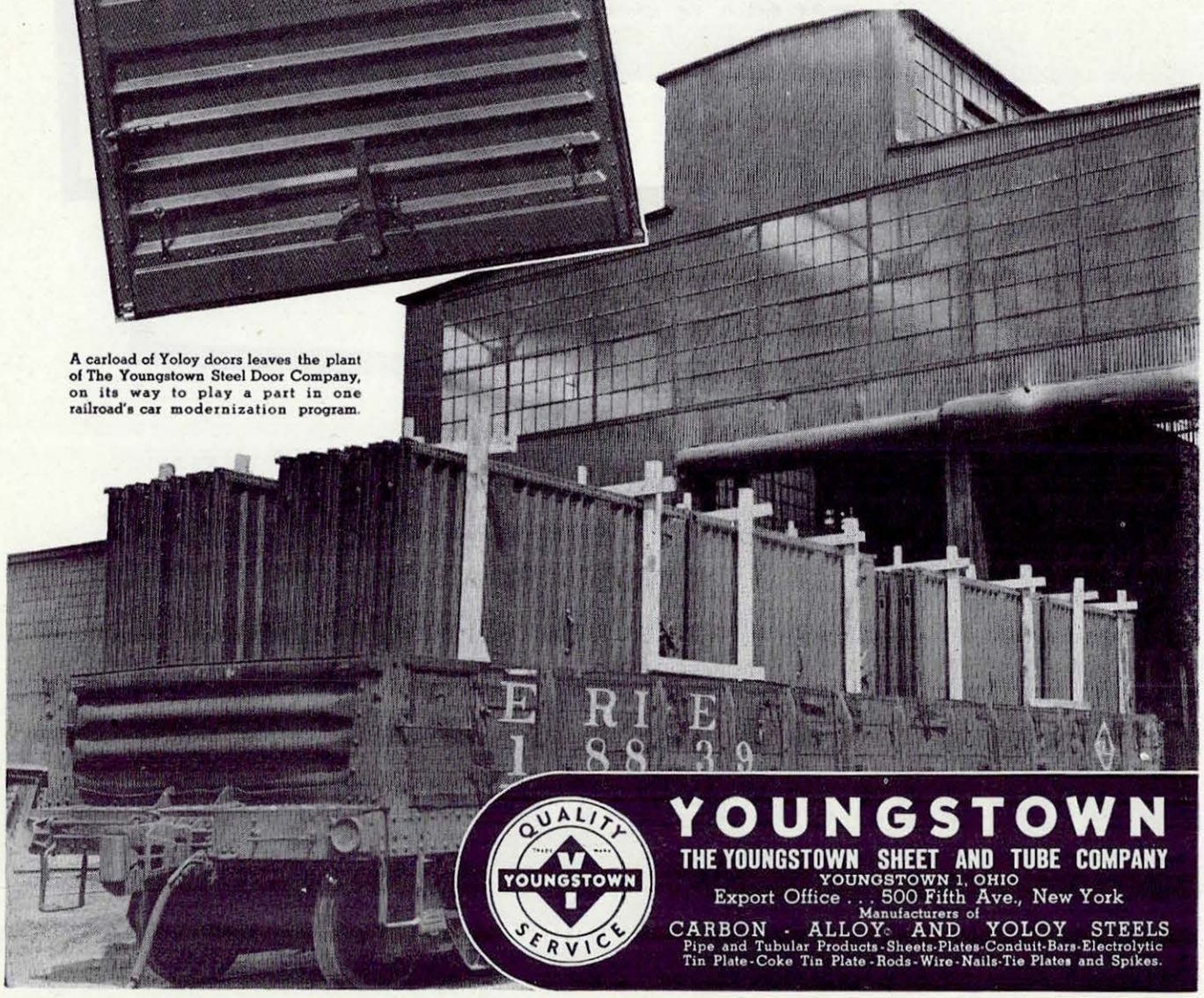


THIS new box car door is fabricated from deep drawing cold reduced Yoloy--the nickle-copper-phosphorus steel that offers a practical solution to the corrosion attack that this type of equipment must endure. This cold reduced low alloy high tensile steel insures better appearance, minimum upkeep and longer life.

The corrosion resistance property makes possible the use of thinner sheets that are also stronger and tougher than the usual carbon sheets. The net result is a light weight door that keeps its shape and is easier to operate through a long service life.

Investigate Yoloy now. Use it for car doors and sides and reduce dead weight as much as 25%. Write, wire or phone for full information on this proven high-tensile steel.

A carload of Yoloy doors leaves the plant of The Youngstown Steel Door Company, on its way to play a part in one railroad's car modernization program.



QUALITY YOUNGSTOWN SERVICE

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

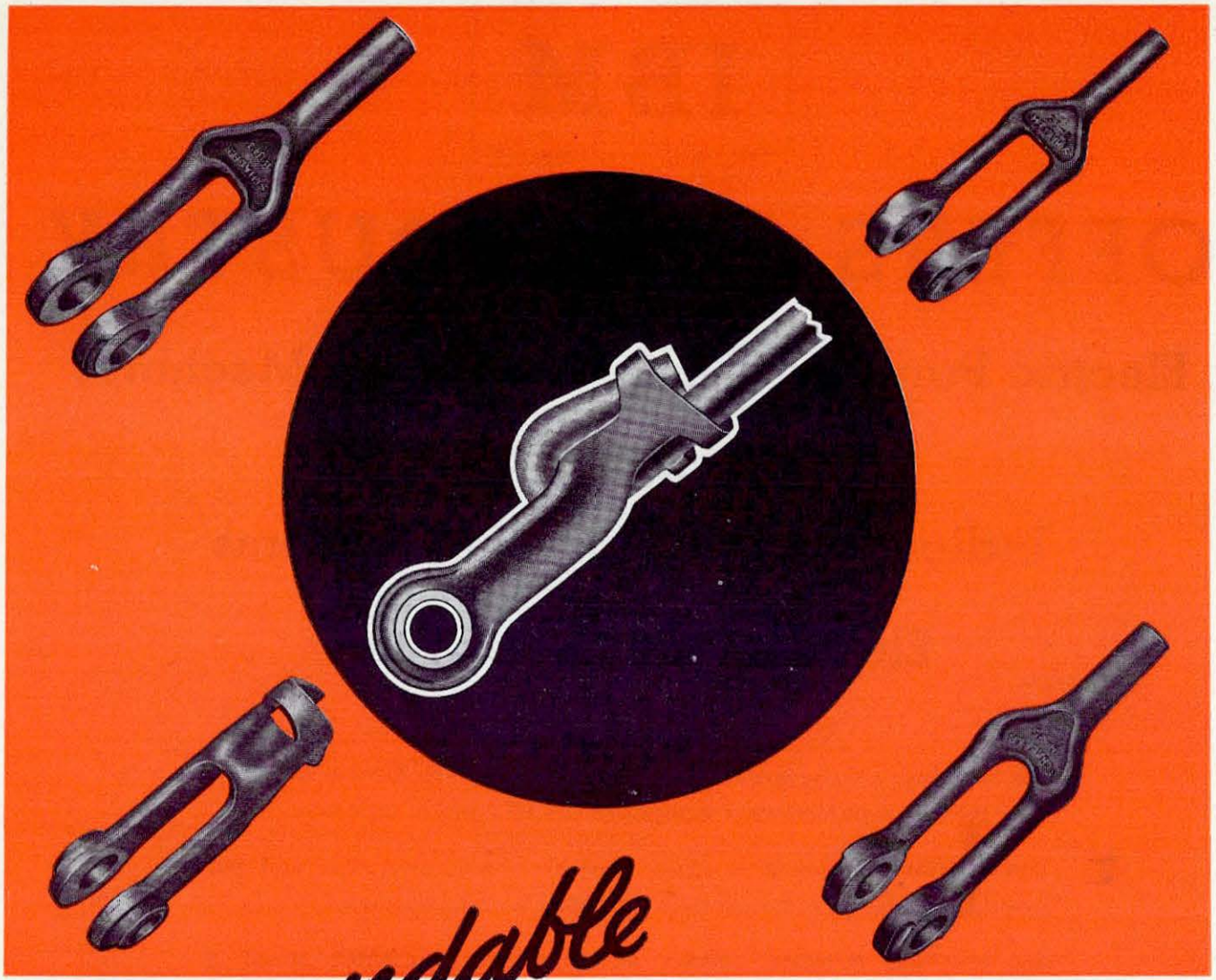
YOUNGSTOWN 1, OHIO

Export Office . . . 500 Fifth Ave., New York

Manufacturers of

CARBON · ALLOY AND YOLOY STEELS

Pipe and Tubular Products-Sheets-Plates-Conduit-Bars-Electrolytic Tin Plate-Coke Tin Plate-Rods-Wire-Nails-Tie Plates and Spikes.



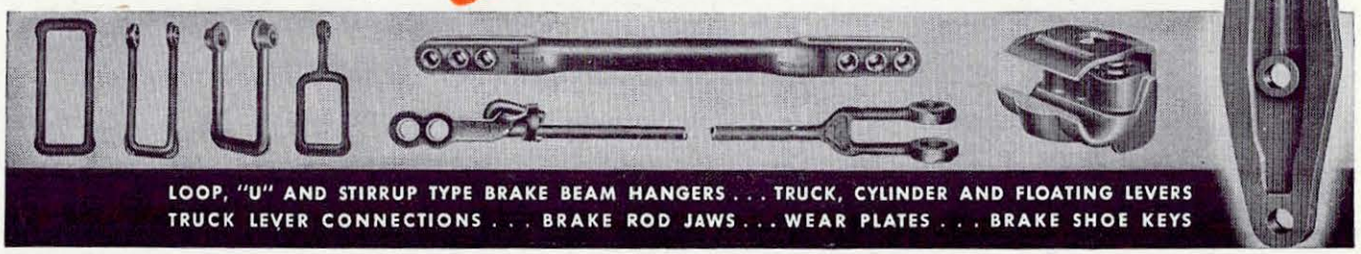
Dependable Jaws

Forged by Schaefer to develop in every part of the jaw the full strength of the Brake Rod.

Write for Catalog No. 445

Schaefer EQUIPMENT COMPANY

KOPPERS BUILDING • PITTSBURGH, PA.



LOOP, "U" AND STIRRUP TYPE BRAKE BEAM HANGERS . . . TRUCK, CYLINDER AND FLOATING LEVERS
TRUCK LEVER CONNECTIONS . . . BRAKE ROD JAWS . . . WEAR PLATES . . . BRAKE SHOE KEYS

IBM

OFFERS TO INDUSTRY

Electric Punched Card Accounting Machines

Time Recording, Indicating and Signaling Systems

Electromatic Typewriters

IBM has always recognized its one responsibility—to furnish the finest, most modern administrative equipment for all types of industry.

Today, IBM equipment is again available—new, improved and perfected through extensive research in IBM's own laboratories.

IBM ELECTRIC PUNCHED CARD ACCOUNTING MACHINES speed up management reports—offer time-saving accounting methods which can be applied to the advantage of *all* departments.

IBM TIME RECORDING, INDICATING AND SIGNALING SYSTEMS supply accurate, legible records of the hours worked by each employee on each job; furnish one correct time for all operations; and signal clearly the starting and stopping time of each shift.

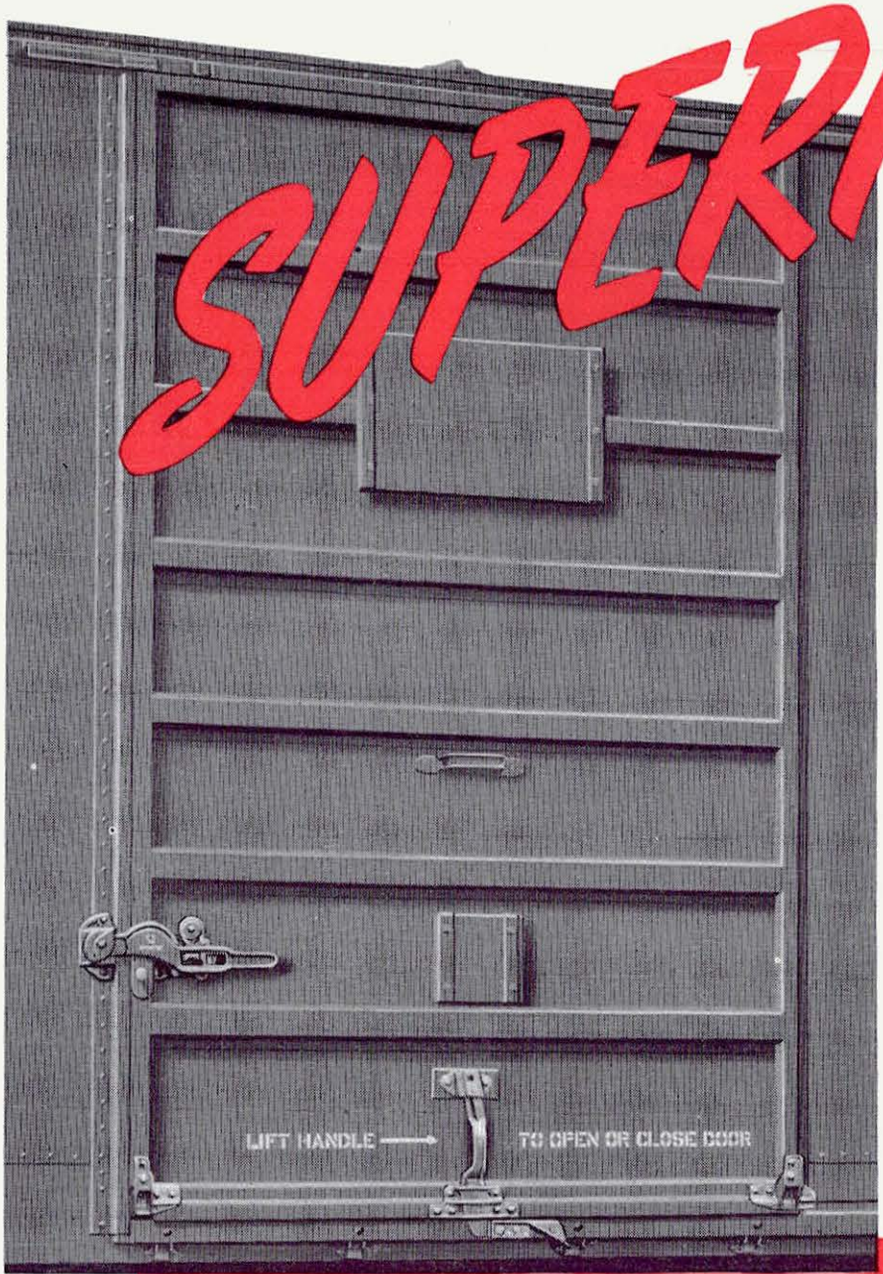
IBM ELECTROMATIC TYPEWRITERS—completely electric in operation—are of definite benefit to all departments where speed and efficiency are required and are especially suited to all types of work involving record-keeping and carbon copies.

IBM SERVICE BUREAUS make available the facilities of IBM Electric Punched Card Accounting Machines on a temporary basis to cover peak-load periods or any unexpected volume of work.

INTERNATIONAL BUSINESS MACHINES CORPORATION

World Headquarters Building, 590 Madison Avenue, New York 22, N. Y.

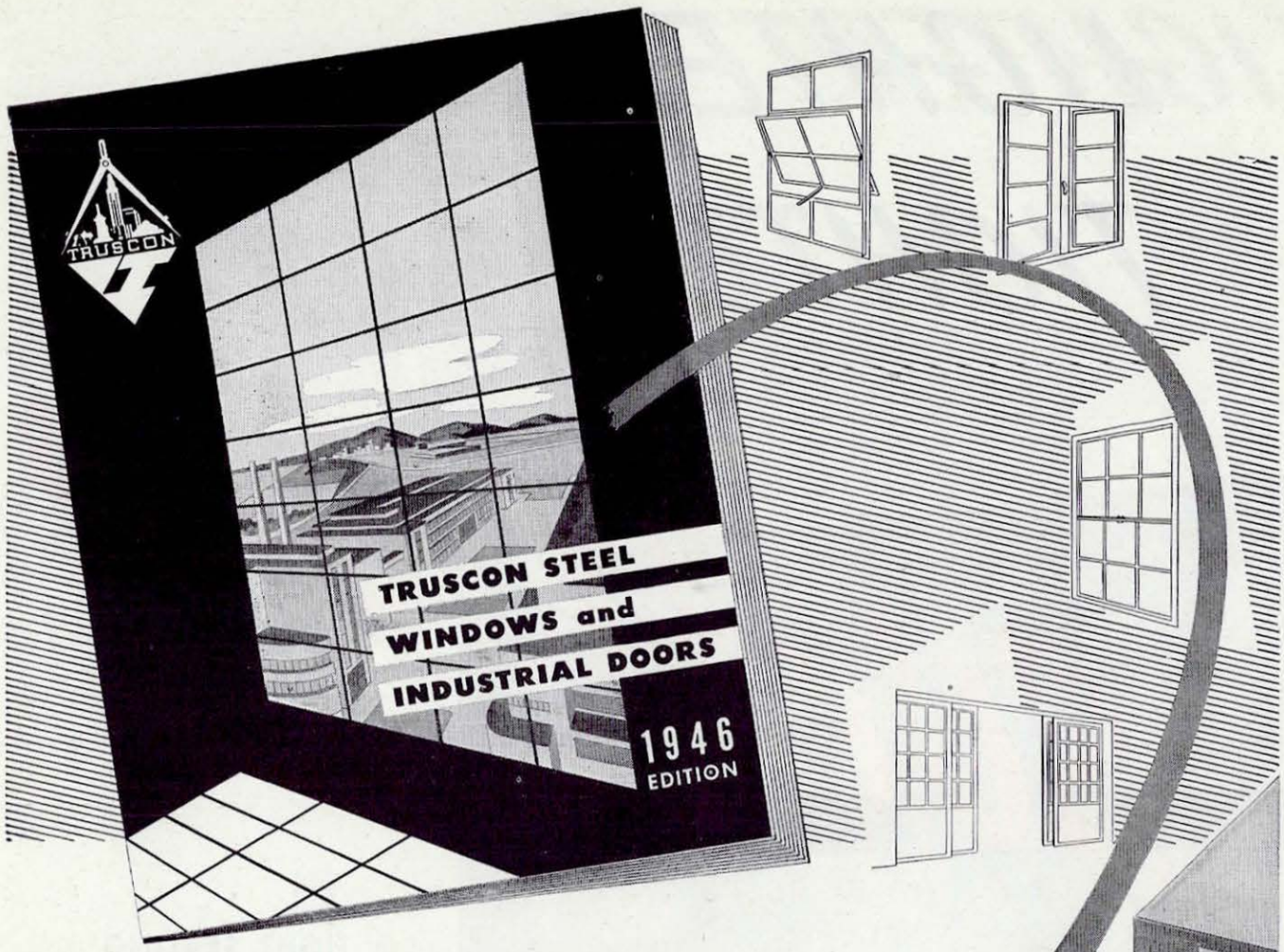
LIGHTER TIGHTER SUPERIOR!



- TIGHT SEALING
- LIGHT WEIGHT
- FREE ROLLING
- SMOOTH INTERIOR
- NO WATER POCKETS
- AUTOMATIC LOCK
- TIME TESTED

SUPERIOR CAR DOOR CO.

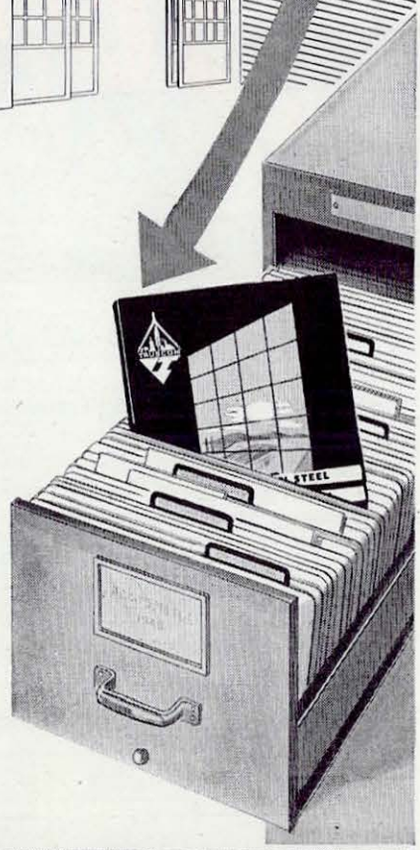
McCORMICK BUILDING • CHICAGO 4



A Necessity FOR YOUR FILES

. . this new preprint of Truscon's complete steel window and door catalog as it will appear in 1946 Sweet's Architectural File

Gives complete details on types, sizes, specifications and installation of entire range of Truscon Steel Windows for every building need. Also complete information on Truscon Steel Doors for all industrial requirements. You need this new catalog, containing latest Metal Window Industry standards, for quick, accurate building design and construction. Simplifies your job of planning and specifying . . . assures maximum economy of construction cost. Write for your free copy of the Truscon Steel Window and Industrial Door Catalog today.



TRUSCON STEEL COMPANY

YOUNGSTOWN 1, OHIO ◦ Subsidiary of Republic Steel Corporation

Manufacturers of a Complete Line of Steel Windows and Mechanical Operators . . . Industrial Steel Doors . . . Steel Joists . . . Metal Lath . . . Complete Steel Buildings . . . Steeldeck Roofs . . . Reinforcing Steel . . . Floodlight Towers . . . Steel Boxes and Platforms . . . Foundry Flasks . . . Weltruss Crossings.

Congratulations

PENNSYLVANIA RAILROAD

ON YOUR
100th
ANNIVERSARY

1846 — 1946

W. H. MINER INC. CHICAGO

ANNOUNCING

A *NEW* VISCOUS TORSIONAL VIBRATION DAMPER

for internal combustion engines of all sizes

Houdaille announces an entirely new type of Torsional Vibration Damper.

It has only three parts—a damper mass, its housing, a bronze bushing.

It is viscous—using the newly developed Silicone fluid which was chosen for its inherent stability and nearly flat viscosity curve.

It is untuned—so that it minimizes BOTH major and minor critical orders of vibration.

It is non-critical—so that it is not sensitive to temperature variations.

It *damps*. It is *not* a de-tuner.

Simple as it is, it solves torsional vibration problems more ideally than any other device.

It will, we believe, outlast the life of the engine.

Designed and produced exclusively by Houdaille, the new Torsional Vibration Damper should prove one of the most important engineering discoveries of recent years.

Our engineers gladly will design a Houdaille Viscous Torsional Vibration Damper to meet the requirements of specific engines—of any size—in the internal combustion field.

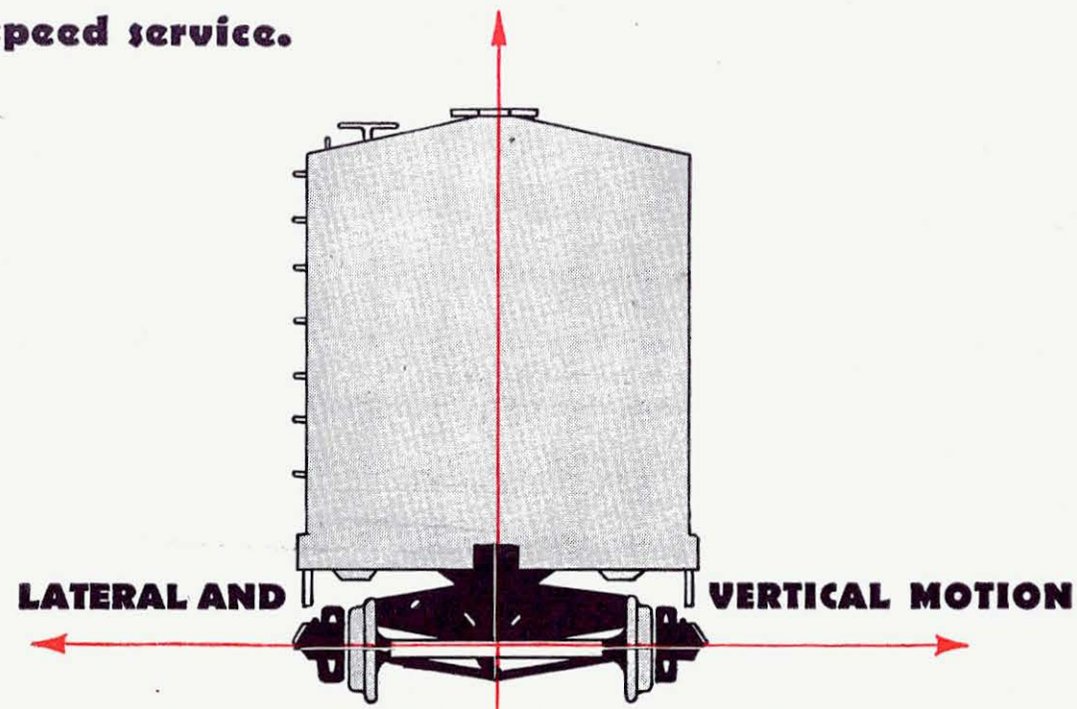
HOUDE ENGINEERING DIVISION OF
HOUDAILLE-HERSHEY CORPORATION
MAKERS OF HYDRAULIC CONTROLS
BUFFALO 11, NEW YORK

Introducing

SCULLIN L-V TRUCK

LATERAL-VERTICAL
CUSHIONED MOTION

A new freight car truck designed to prevent lading damage and operate safely in general and high speed service.



COMPLETELY CUSHIONED
BOTH UNDER CONTROL

Watch for More News Soon!

ARMY ★ NAVY

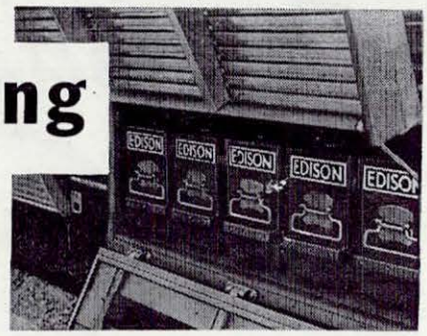
SCULLIN STEEL CO

SAINT LOUIS 10, MISSOURI

STEEL CASTING MANUFACTURERS SINCE 1899

NEW YORK • CHICAGO • PHILADELPHIA • CLEVELAND • ST. PAUL • BALTIMORE • RICHMOND, VA. • MEXICO CITY, D. F.

Making the Most of a Weight-Saving Opportunity



EVERY battery compartment is an opportunity to gain such desirable advantages as light weight, structural strength and dependability in the battery power supply on passenger cars. You make the most of these opportunities when you use Edison Alkaline Batteries.

Being the *lightest* of all types of batteries available for railway car services, alkaline batteries enable you to provide the necessary kilowatt-hour capacity and yet keep dead-weight down to the minimum. The greater the battery capacity required, the greater is the saving in weight with alkaline batteries . . . and the saving is effected where it counts most—near the middle of the car.

Steel-cell construction is one of the reasons for the light weight of alkaline batteries and makes them a desirable "passenger" for still another reason—their *unmatched mechanical strength.* They are one of the few car accessories in which you can save weight and gain structural ruggedness at the same time.

Because alkaline batteries have a fool-proof electrochemical principle of operation along with their steel-cell construction, they provide a power source whose inherent operating dependability is unequalled. They are so dependable, in fact, that after delivering normal life on passenger cars, they are often re-applied to other railroad services where they give additional years of reliable operation.

For tomorrow's better passenger cars, use the best in battery power . . . the *Edison Storage Battery* Division of Thomas A. Edison, Incorporated, West Orange, New Jersey. In Canada: International Equipment Co., Ltd., Montreal and Toronto.

Edison

THE LIGHTWEIGHT BATTERY
FOR LIGHTWEIGHT CARS

Katy's ANNUAL REPORT on its DIAMOND ANNIVERSARY YEAR...

How Katy's Dollars... were Earned and Used!

1945 Income Account in Brief

DOLLARS EARNED		
Transportation of Freight		$63,533,030
Transportation of Passengers		13,052,816
Other transportation Revenues		6,508,048
Making a Total Operating Revenue of		83,093,894
Other Income Was		224,823
Making a Total Income of		83,318,717
DOLLARS USED		
Wages and Salaries Paid Empoyes		$34,319,191
Miscellaneous Materials, Rental of Equipment, Etc.		20,007,724
Taxes		12,973,903
Locomotive Fuel		4,393,741
Depreciation Charge on Rolling Stock and Structures		2,675,732
Making a Total Operating Expense of		74,370,291
LEAVING		
Income before Fixed Charges of		$8,948,426
Fixed and Contingent Charges		3,080,827
RESULTING		
In Net Income After Fixed Charges and Other Deductions		5,867,599
OF WHICH		
There was appropriated for Possible Increase in Tax Liability and for Other Purposes		2,000,000
Balance of Income Transferred to Earned Surplus		$3,867,599

With the victorious conclusion of the war, Katy also celebrated its 75th year of service to the Nation and the Southwest.

Operating revenues for the year were lower than 1944 by $928,148 but the decrease was more than offset by a reduction of $1,680,808 in operating expenses. Decrease in operating income occasioned by an increase in taxes was overcome in part by reduction of rent and interest payments. Income carried to earned surplus was $3,867,599.

Continuing a long-term program of modernization and fixed-charge reduction, designed to place the railroad in a more favorable position to meet the forseeable future, Katy's physical properties during the year received the benefit of $26,006,455 worth of intensive maintenance and construction, at the same time bonded debt was being reduced by $4,538,500. Total fixed-interest debt reduction in the 4 years ending December 31, 1945 aggregates $41,686,765.

Today, the Katy is eminently fitted both in plant and capital structure to handle the traffic to and from the most rapidly growing section of the U. S. Seventy-five years old in experience, it is one of the newest railroads in morale and physical equipment.

D. V. FRASER, *President*
R. J. MORFA, *Chairman of the Board*

REDUCTION OF FIXED INTEREST DEBT

Outstanding Dec. 1941	Outstanding Dec. 1945	Reduction in 4 years
$98,443,419	$56,756,654	$41,686,765

A Copy of The Annual Report will be sent upon request.
St. Louis 1, Mo.

★

MISSOURI-KANSAS-TEXAS LINES

356

On the Busiest Stretch of Track in the World . . .

THE PENNSYLVANIA PROVES

ELECTRIFICATION PAYS!

Busiest stretch of track on earth is the 226-mile, mostly 4-track, electrified system of the Pennsylvania Railroad between New York and Washington—no other section of main-line railroad has such a great density of passenger traffic.

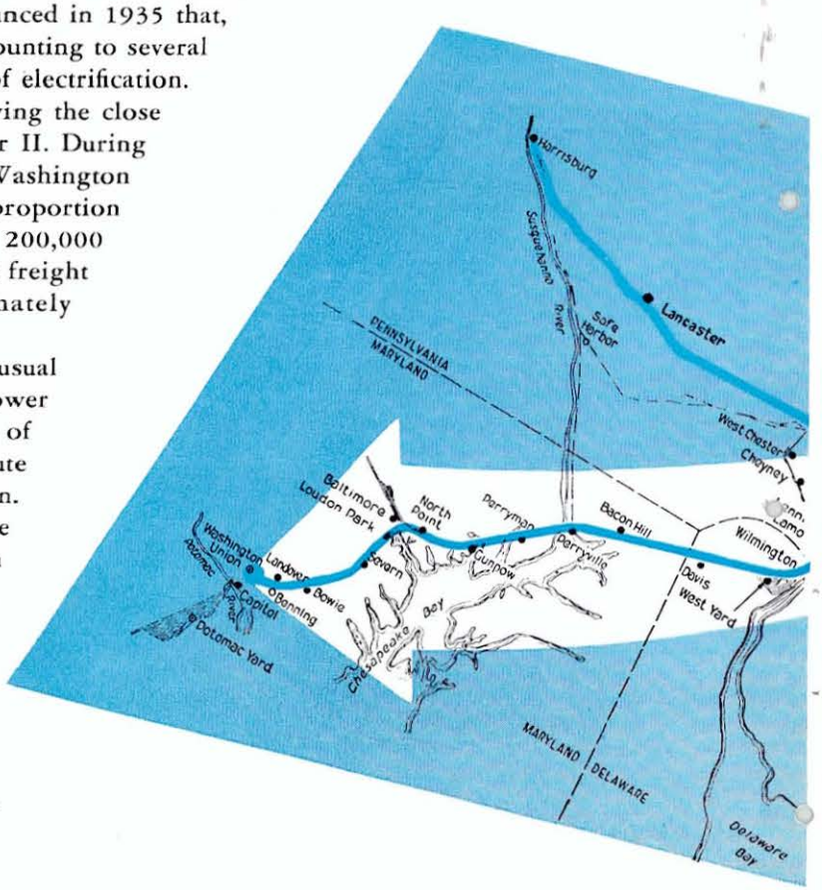
The decision to electrify this operation was made during the period of widespread railroad improvements and betterments which followed the close of World War I. The Pennsylvania had been experimenting with, and using, electric motive power for many years, and the greater flexibility—and resulting increase in track capacity—made possible by electric power, offered the soundest economical solution to the problem of handling a steadily rising volume of traffic. The New York-Washington electrification was finally completed in 1935 for both freight and passenger service.

The resulting economies and improvements in operation have more than justified the expense involved. The Pennsylvania announced in 1935 that, beginning June 1st, a saving in operating expenses amounting to several million dollars annually would be effected as a result of electrification.

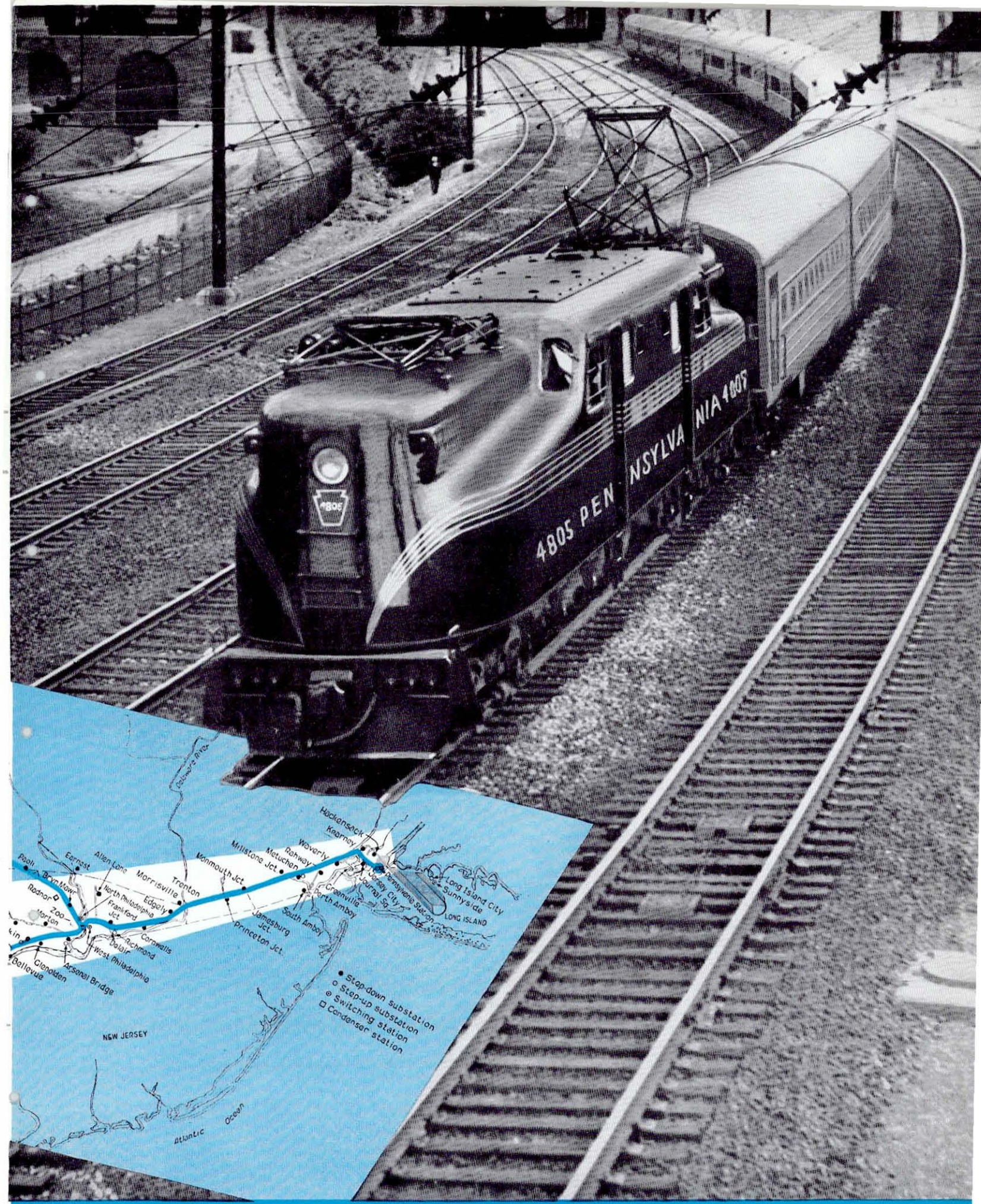
But the soundness of the planning that began following the close of the first World War was best proven in World War II. During four war years, 1942 through 1945, the New York-Washington line carried nearly 200,000,000 passengers, a very large proportion of whom were men and women in uniform. Over 200,000 passengers were repeatedly hauled in a single day! The freight transported in these four war years was approximately 160,000,000 tons.

Where great density of traffic, steep grades or unusual structures make operation with other forms of motive power difficult, electrification is often justified. No other type of power offers such tremendous tractive effort, such absolute cleanliness and quiet, such flexibility in its utilization.

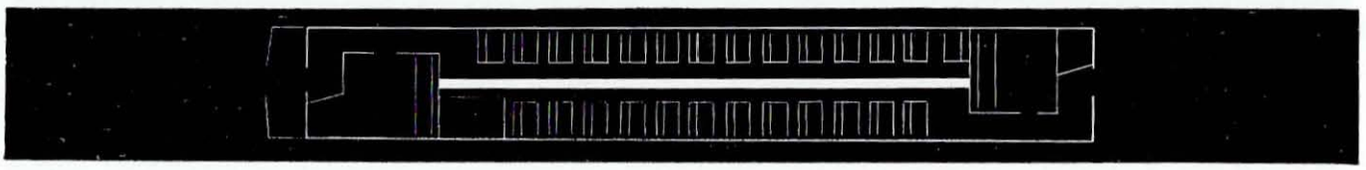
The General Electric Company has pioneered in the development of electric motive power for more than 50 years, and is indeed proud to have been associated with the Pennsylvania Railroad from the beginning of the electrification of its lines from New York to Philadelphia, Baltimore and Washington, and from Philadelphia to Harrisburg. This electrification is typical of the long-range vision and sound economic planning that for 100 years have characterized every major step in the development of the Pennsylvania—one of the world's truly great railroads.



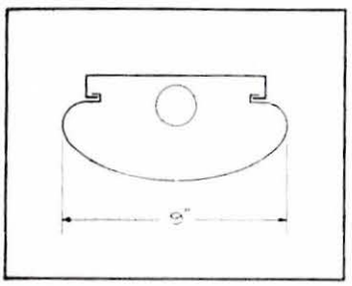
"Where electrification is economically sound and in the best interests of the public, and where the character of traffic is such that it makes better service possible, the Pennsylvania Railroad uses electricity."



GENERAL ELECTRIC



FLUORESCENT LIGHTED COACH



Center ceiling continuous light source • • • Uniform luminous brightness of light source without glare • • • 12 watts per foot of car length for lamps and ballasts provide 13.5 footcandles illumination at 45° reading planes of all aisle seats and 10.5 footcandles at 45° reading planes of all window seats • • • less than 2 candles per square inch brightness of visible light source • • • Cheerful luminous brightness on ceiling • • • "Safety 68" Plexiglas shades of 80% light transmission and minimum weight • • • Low installation and maintenance costs • • • All this is provided by ample generator capacity, accurately controlled voltage and frequency from Safety Company generating and regulating equipment.

THE SAFETY CAR HEATING AND LIGHTING COMPANY INC.

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PENNSYLVANIA RAILROAD

on its completion of

ONE HUNDRED YEARS OF

TRANSPORTATION PROGRESS

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Westinghouse . . . *a Half Century of*

RAILROAD . . . . . *A Century of Transportation Progress*

Motive Power Developments!

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To

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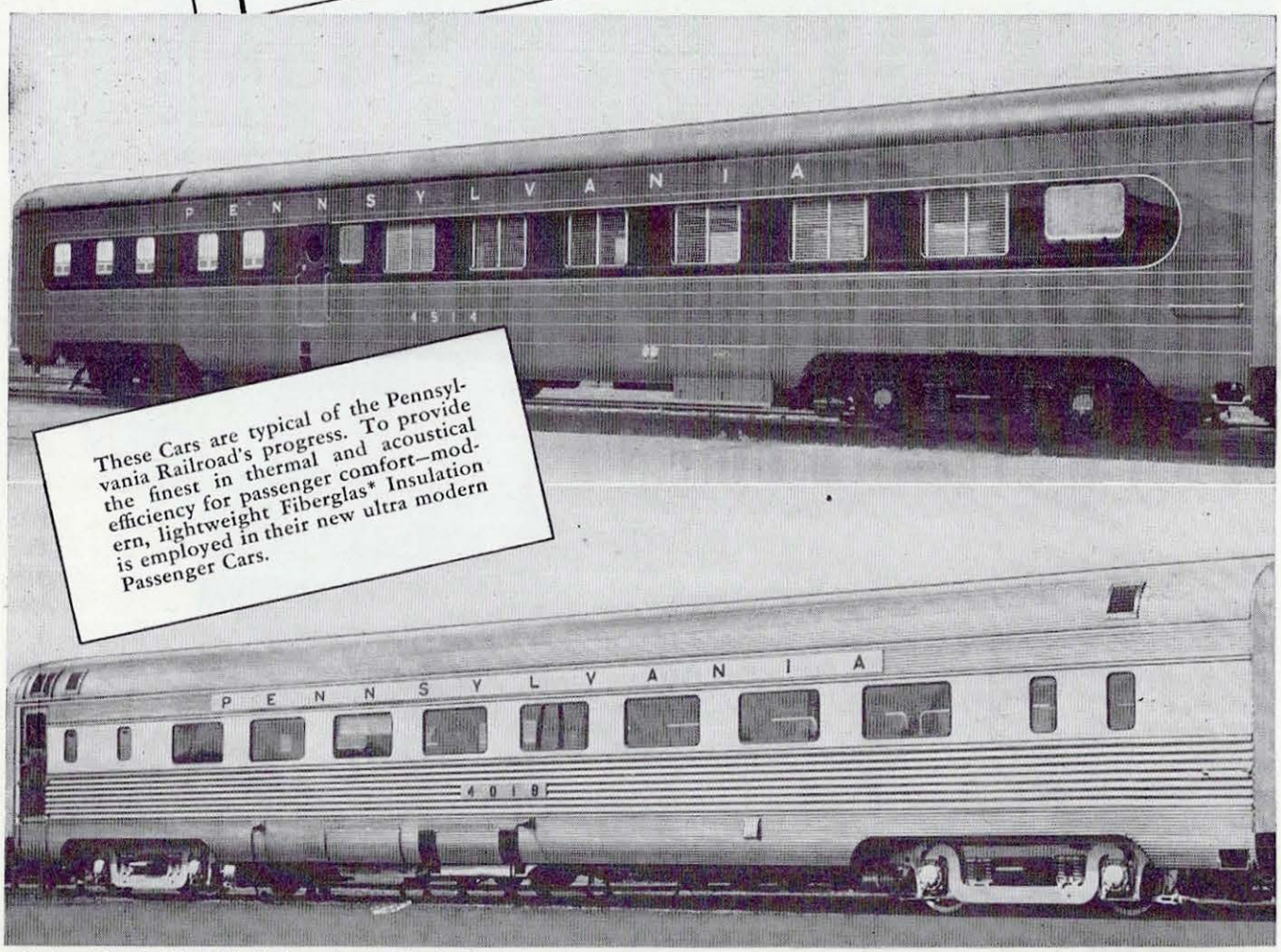
For Their

100 Years of Service and Achievement



These Cars are typical of the Pennsylvania Railroad's progress. To provide the finest in thermal and acoustical efficiency for passenger comfort—modern, lightweight Fiberglas* Insulation is employed in their new ultra modern Passenger Cars.

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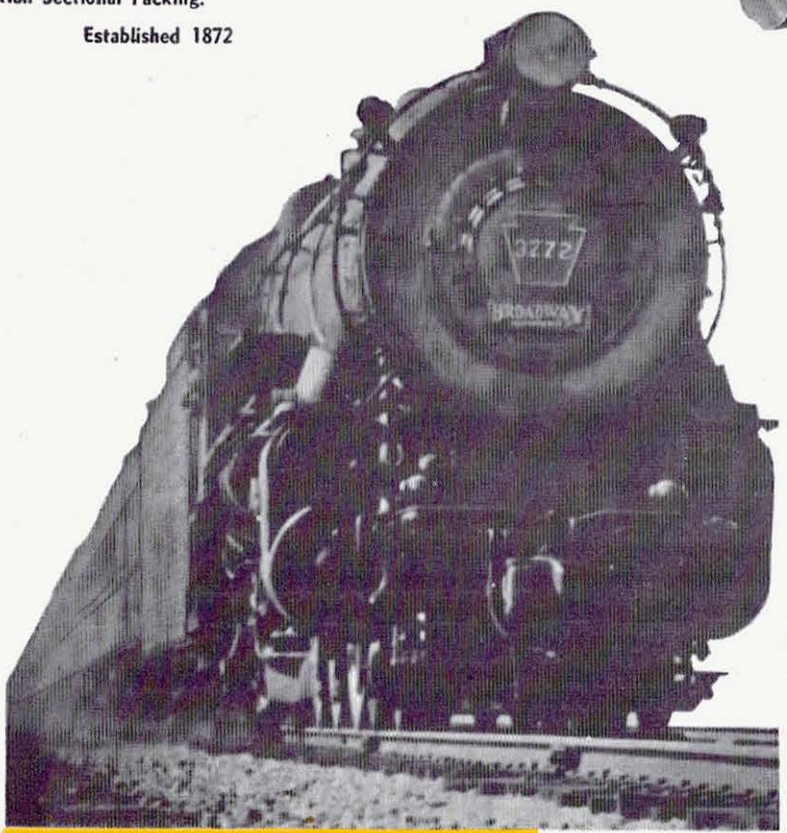
Pioneers in the Development of the Light Weight Piston and Combination Sectional Packing.

Established 1872



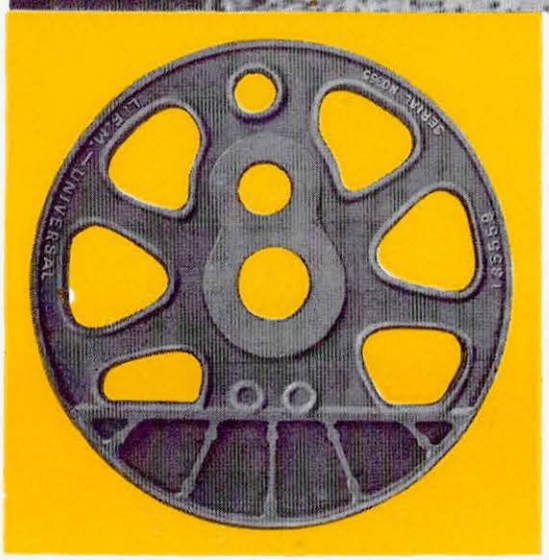
MORE ECONOMY BETTER SERVICE

FOR LOCOMOTIVES

IMPROVED locomotive operation is a "must" if railroad performance is to meet modern-day traffic demands.

One answer is the application of LFM Light Weight Alloy Steel Pistons and Universal Sectional Bull and Packing Rings, which are approximately 50% lighter than the conventional type. Improved locomotive operation will result because the application of Light Weight LFM Pistons means longer locomotive runs . . . less time out for service . . . and a minimum of required locomotive maintenance.

When you want more economy and better service from your locomotives — consult with LFM's railroad mechanical experts.



Scientific casting of LFM Universal Wheel Centers produces a strong, uniform section wheel that eliminates crowning and flattening between spokes.

THE LOCOMOTIVE FINISHED MATERIAL CO.

Atchison, Kansas

New York City Chicago, Illinois

CONGRATULATIONS

WE salute you on your 100th Birthday—laud you for your leadership—and thank you for your many contributions to our Nation's Progress.

CARRY ON!

OGLE CONSTRUCTION CO.
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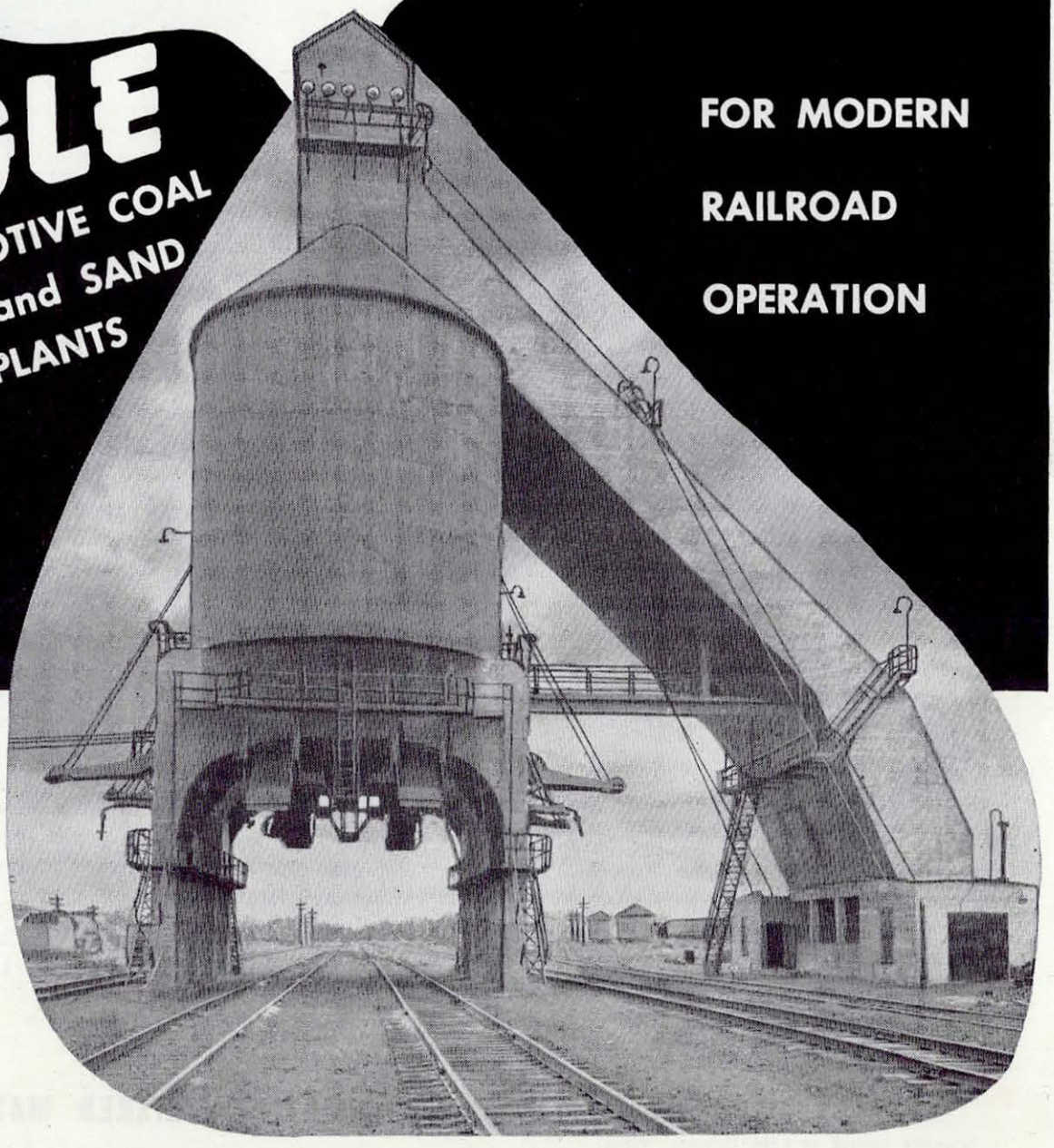
LOCOMOTIVE COAL ASH and SAND PLANTS

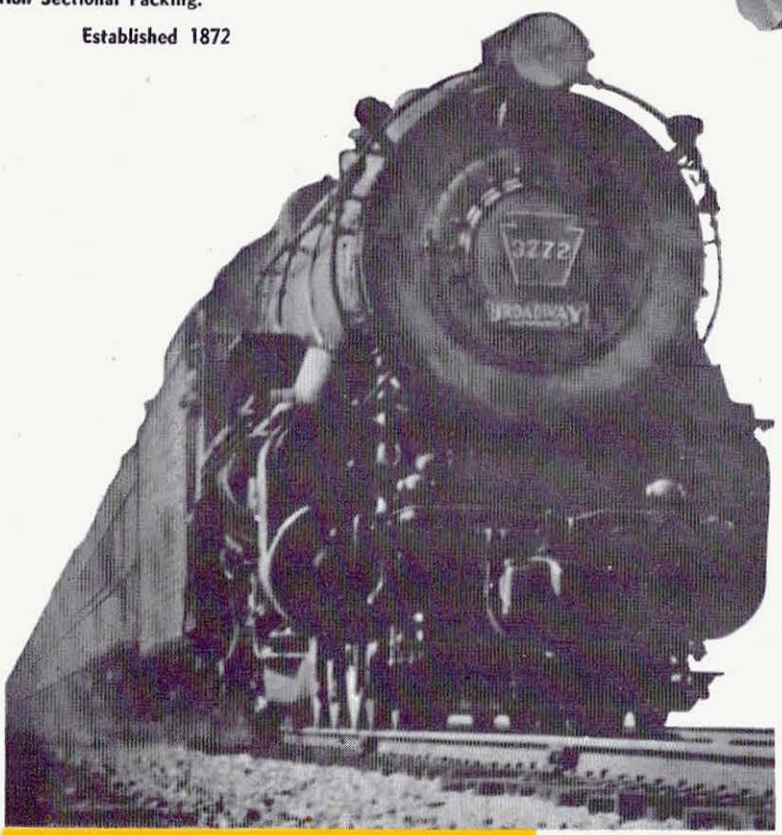
FOR MODERN RAILROAD OPERATION



In one year this 1250 ton coaling station handled over 1,000,000 tons of coal. It is one of 55 Ogle locomotive coal, ash and sand handling plants on the Pennsylvania Railroad.

Pioneers in the Development of the Light Weight Piston and Combination Sectional Packing.

Established 1872



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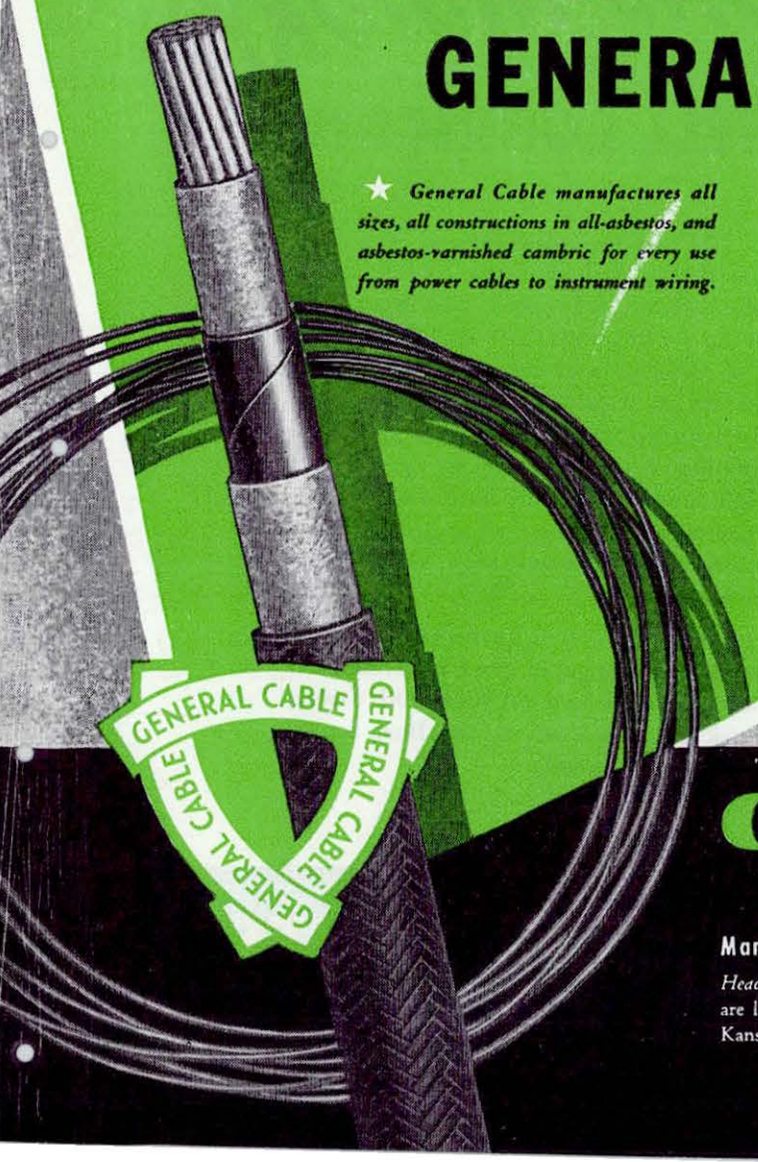

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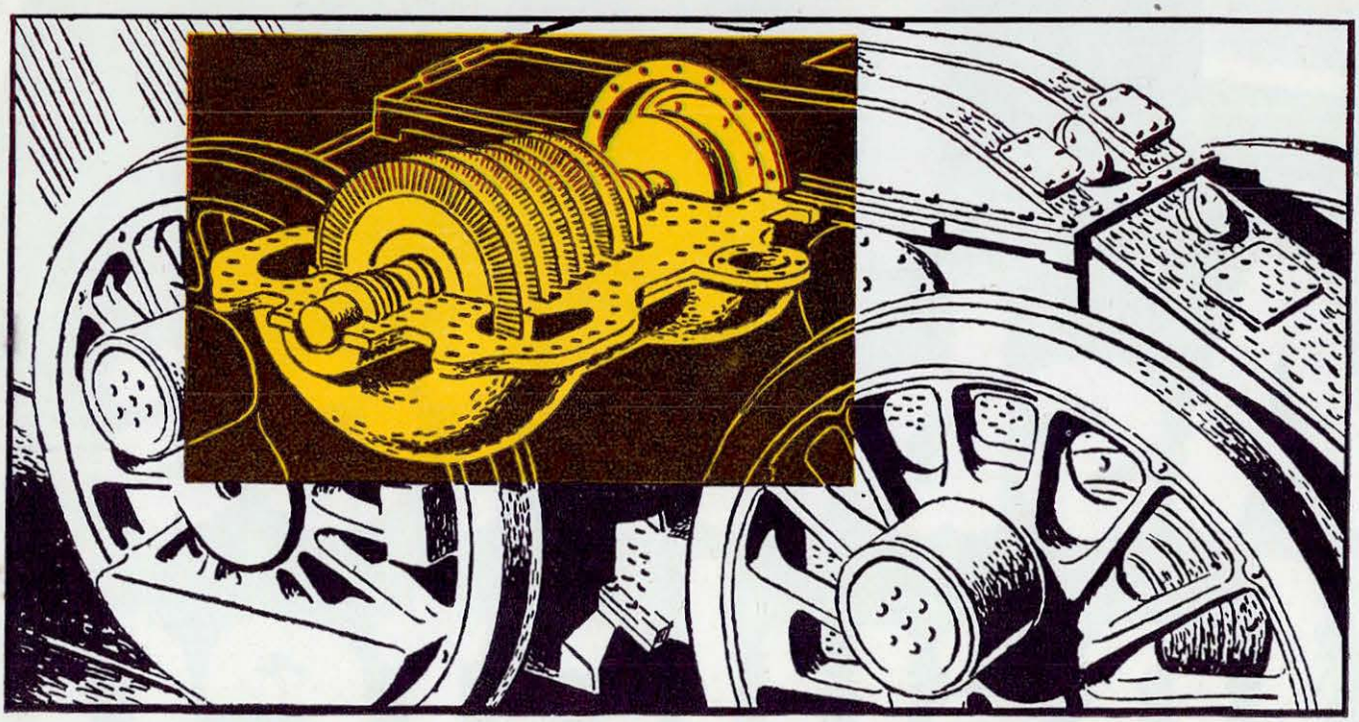


New Steam Turbine Locomotive

MAKING RAILROAD HISTORY

...with the aid of a SHELL LUBRICANT

TODAY a huge, new kind of locomotive is speeding over the countryside. This locomotive has no cylinders, pistons or driving rods. Its 6900 shaft horsepower comes from a steam turbine no larger than a refrigerator.

More than 1000 chromium steel blades are mounted on the rotor shaft inside the turbine housing. Steam, shot into the turbine through dozens of nozzles, strikes the first row of blades at 2000 mph, forcing the shaft to revolve. When the locomotive is traveling 100 mph the tips of the largest blades will be traveling nearly 700 mph.

Turbines such as these are subjected to terrific heat, and require a lubricating oil that can do three jobs: 1. Act as a coolant. 2. Lubricate thoroughly. 3. Protect against rust. It also must resist oxidation and sludging which might clog strainers and feed lines, slowing up the oil flow to the bearings. The reduction gearing, 97% efficient and involving high gear tooth pressures, would also be affected.

In Shell Turbo Oil the engineers found the lubricant that can do the job so essential in such high-speed, high-temperature operation. Shell Turbo Oil provides adequate anti-rust protection, and possesses high stability toward oxidation.

For more facts on Shell Turbo Oil and Shell Railroad Lubricants get in touch with Shell Oil Company, Incorporated, 50 West 50th Street, New York 20, New York; or 100 Bush Street, San Francisco, California.

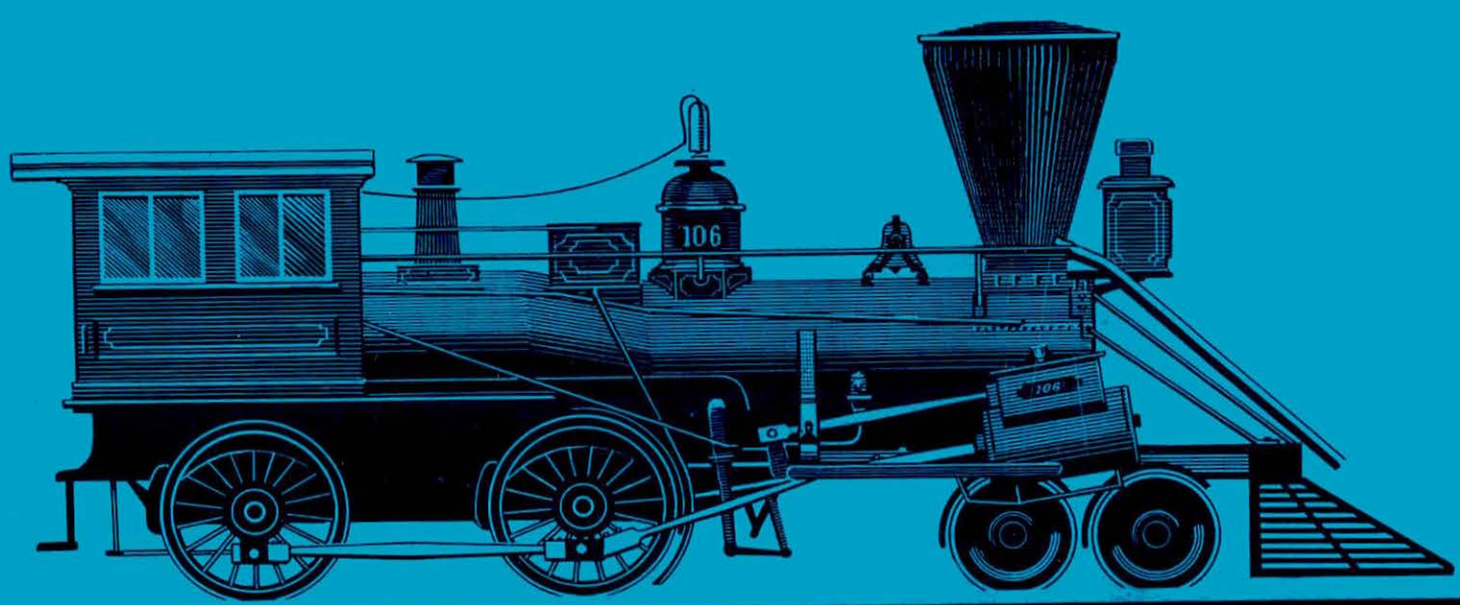
SHELL

SHELL RAILROAD LUBRICANTS

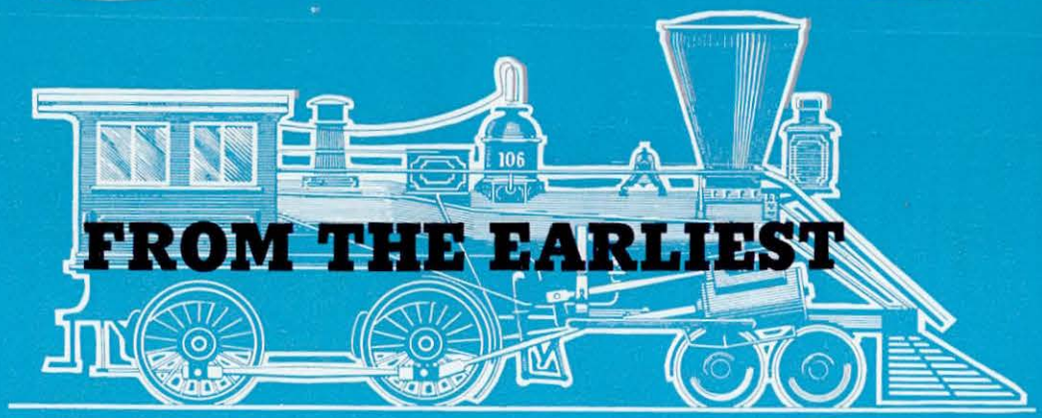
100 YEARS

WITH THE

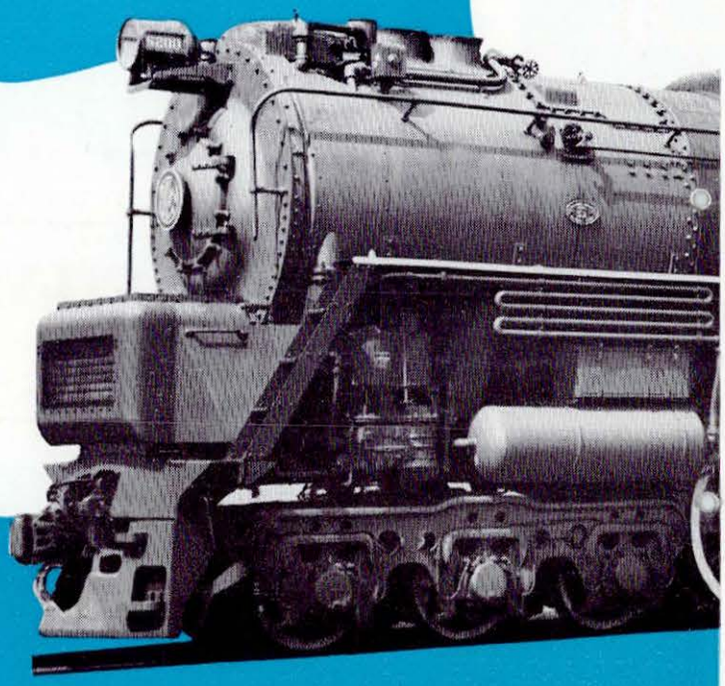
PENNSYLVANIA RAILROAD



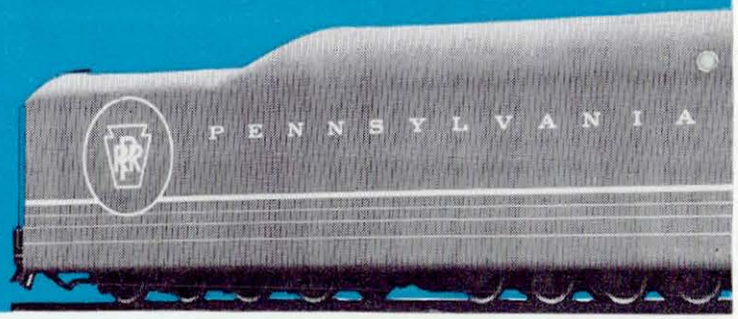
BALDWIN



FROM THE EARLIEST TO



America's first gear-driven steam turbine locomotive, built by Baldwin with turbines and gears by Westinghouse.



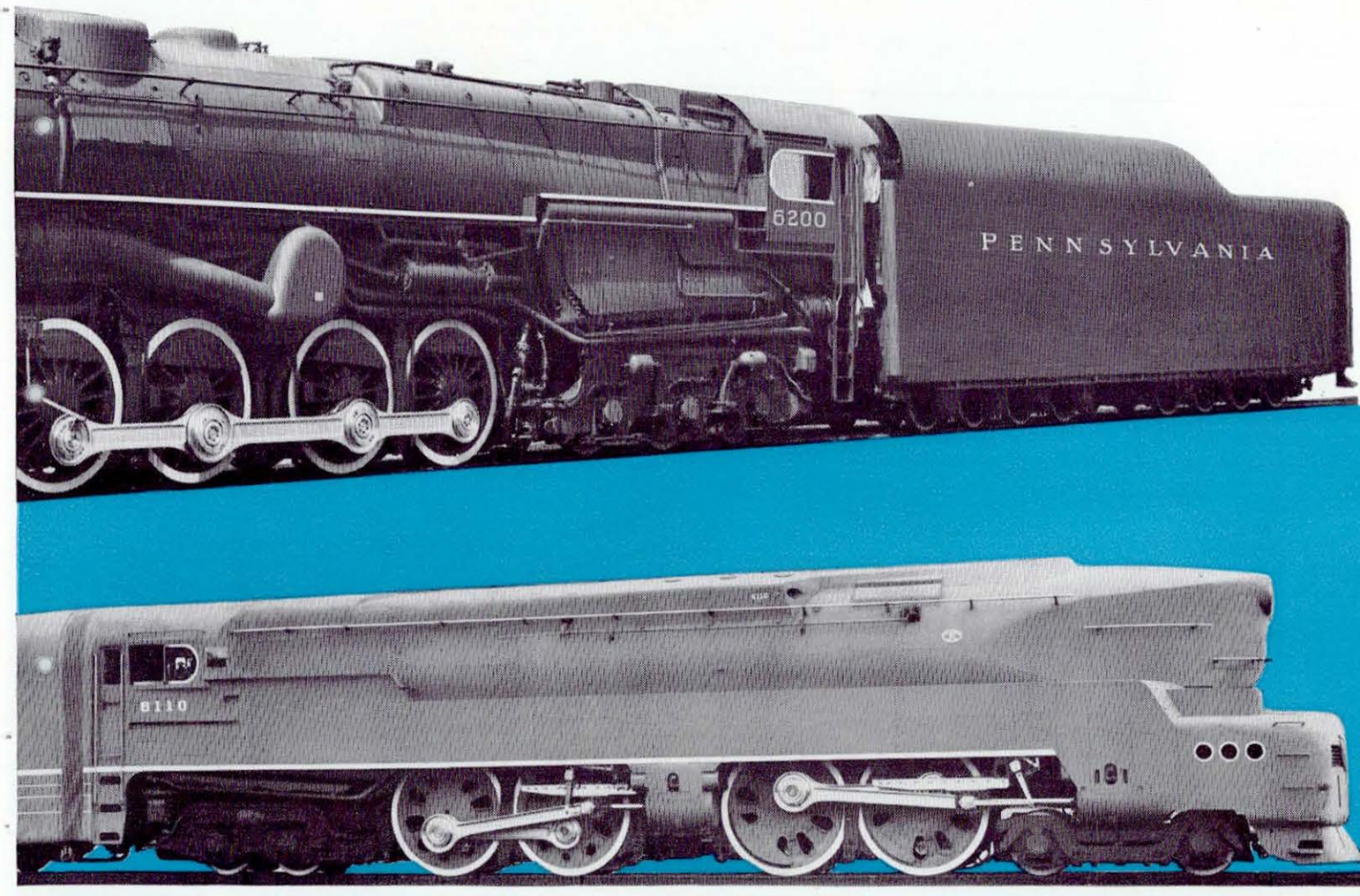
Four-cylinder Duplex locomotive, offering improved performance at all speeds with outstanding advantages at high speeds.

First of its type is this 6500 HP. Baldwin-Westinghouse, non-condensing, geared steam turbine locomotive built for the Pennsylvania Railroad in collaboration with the railroad's engineering staff.

It represents a forward step in steam locomotive construction, opening the way to higher speeds and greater operating efficiency for this class of power.

The 4 cylinder Duplex type for high-speed service offers many advantages, and indicates the progress resulting from the close association of The Baldwin Locomotive Works and the Pennsylvania Railroad.

THE LATEST BALDWIN LOCOMOTIVES



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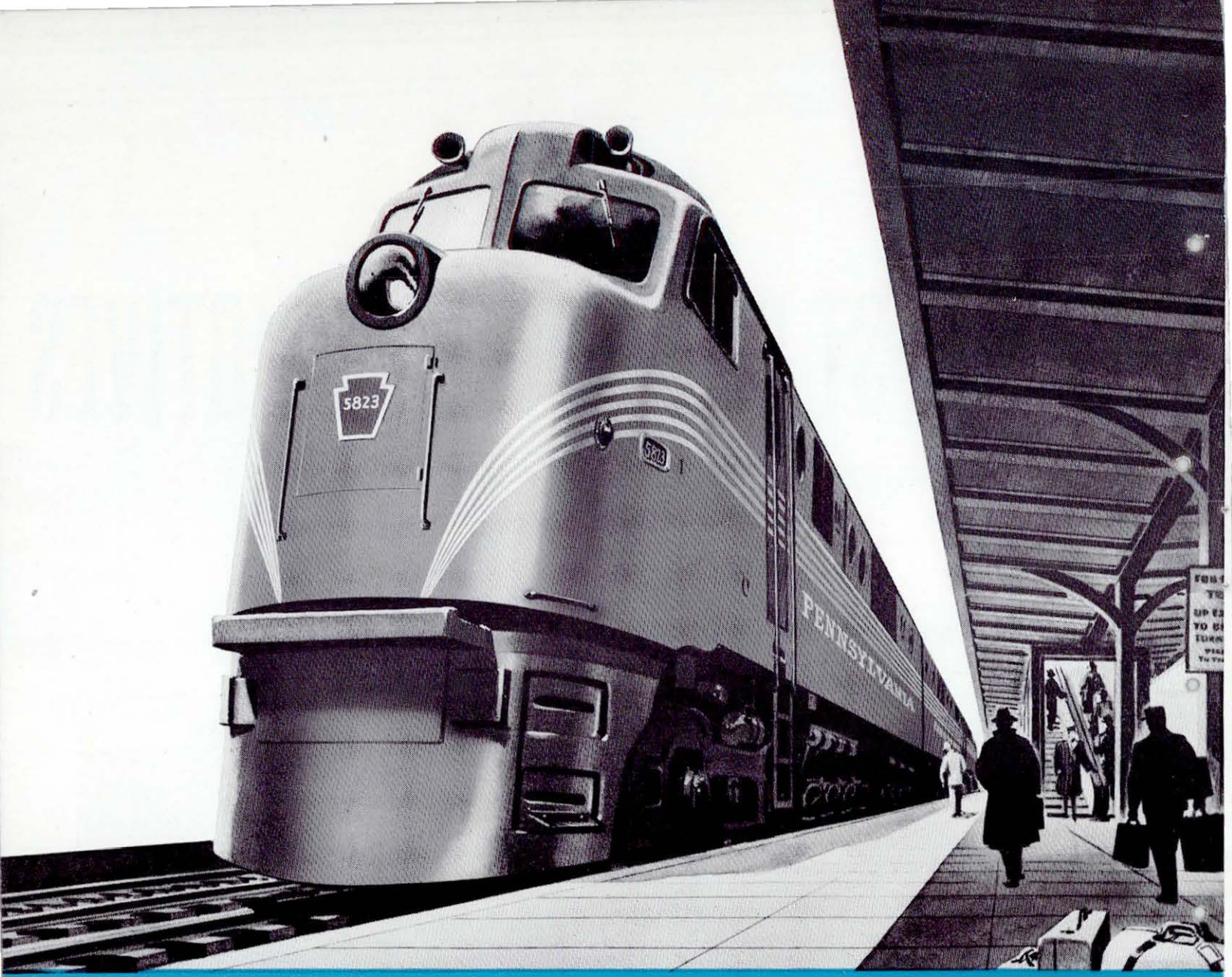


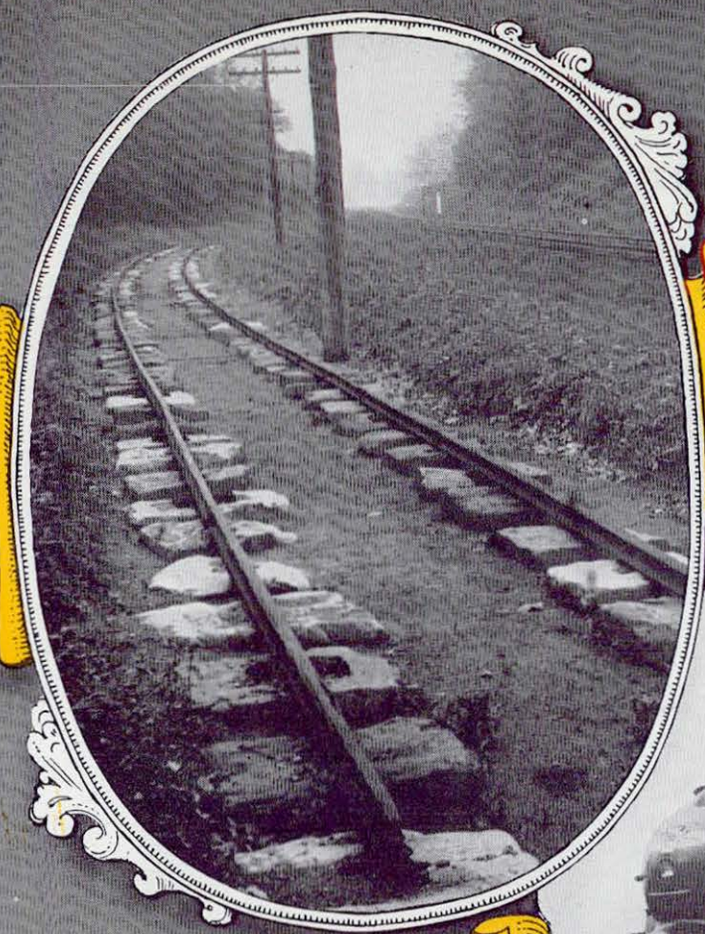
AND NOW the Pennsylvania Railroad's most powerful diesel-electric

A Baldwin-Westinghouse 6000 HP. Diesel-Electric Locomotive—consisting of two 3000 HP. units coupled together with an operator's cab at each end—being built for the Pennsylvania Railroad.

Each of the units will be equipped with two Baldwin 1500 HP. supercharged diesel engines, representing the latest development in the diesel-electric field. The Baldwin Locomotive Works, Locomotive & Southwark Division, Philadelphia 42, Pa., U.S.A. Offices: Philadelphia, New York, Chicago, St. Louis, Washington, Boston, San Francisco, Cleveland, Detroit, Pittsburgh, Houston, Birmingham, Norfolk.

BLW THE BALDWIN GROUP

BALDWIN



In 1831 the first hook-headed spikes ever used, holding double-headed rail, were driven into the same stone ties on which the track still rests near Jamesburg, N.J. Laid for the Camden & Amboy R. R., it became part of the Pennsylvania system in 1846.

Modern well-anchored Pennsylvania track assures safety for today's heavy tonnages at increased speeds by using the best devices and accessories developed in a century of progressive railroading, including the Improved Super Fair Rail Anchor.

1846 THE PENNSYLVANIA RAILROAD 1946

A CENTURY of SERVICE on RAILS

The P. & M. Co. extends congratulations to the Pennsylvania Railroad on the achievement of 100 years of distinguished railroading, and is proud to have participated in this record of success.

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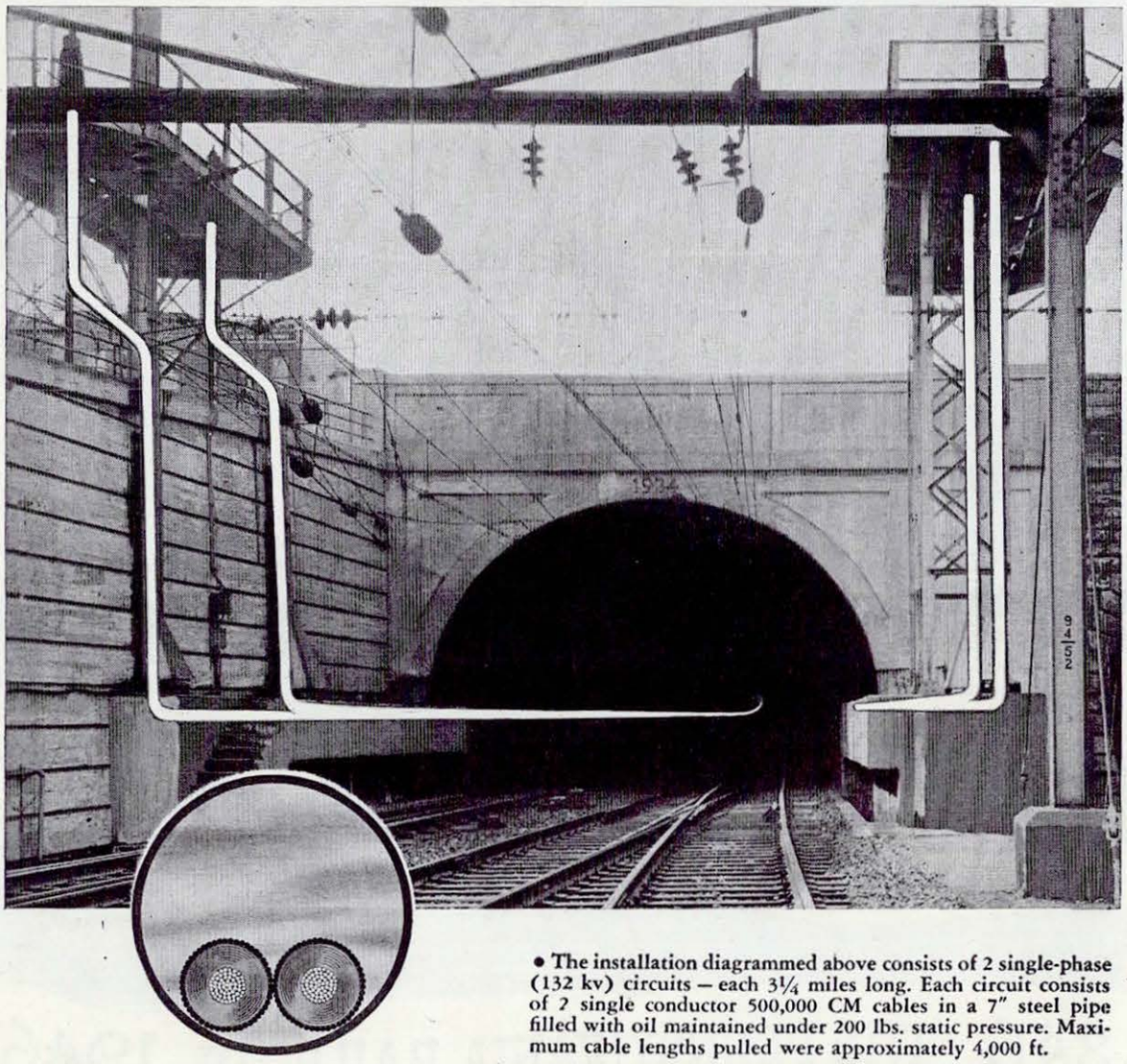

• The installation diagrammed above consists of 2 single-phase (132 kv) circuits – each 3¼ miles long. Each circuit consists of 7 single conductor 500,000 CM cables in a 7" steel pipe filled with oil maintained under 200 lbs. static pressure. Maximum cable lengths pulled were approximately 4,000 ft.

OILOSTATIC TRANSMISSION NOW 11 YEARS IN PENNSYLVANIA'S SERVICE

In February 1935, the Pennsylvania Railroad placed in operation the Oilostatic Electric Transmission System in its Baltimore tunnels to supply high voltage electric power for New York-Washington electrification. This system has functioned without service interruption.

In the Oilostatic Electric Transmission System, paper insulated cables are completely immersed in oil. Ruggedly constructed cables, in an oil-filled pipe line maintained under 200 lbs. static pressure, provide a simple, economical method of handling heavy loads at high voltages.

Oilostatic cable systems are suitable for electrical transmission in congested areas, for urgently needed tie-lines, for railroad electrification, for eliminating overhead construction near airports, and in tunnels and on bridges, for crossing swamps, rivers and other bodies of water.

For free literature which illustrates, diagrams, and describes the Oilostatic Electric Transmission System – or if you wish to talk over a possible installation – get in touch with our nearest district office or write to The Okonite Company, Passaic, New Jersey.

4533

OKONITE-CALLENDER paper insulated power cables

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette, and the Railway Age-Gazette. Name registered in U. S. Patent Office.

Vol. 120 April 13, 1946 No. 15

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In This Issue

Page

The Pennsylvania Is 100 Years Old **756**

It has been a main reliance for both national defense and heavy civilian traffic—It has paid dividends every year for a century.

Locomotives for Today and Tomorrow **765**

An outline of what may be expected of reciprocating steam, geared-steam-turbine, steam-turbine-electric, Diesel-electric, gas-turbine, and electric locomotives.

Diesel Shops on Santa Fe Coast Lines **770**

Part two of this Article describing facilities for repairing and servicing freight locomotives operating primarily between Winslow, Arizona and Barstow, California.

EDITORIALS

Railways Must Have Advances in Rates 753
Little Improvement in Crosstie Production 754
The Pennsylvania's First Hundred Years 754
Crown Sheets Continue to Fail 755
The War of Materials Is Back 755

GENERAL ARTICLES

The Pennsylvania Is 100 Years Old 756
Locomotives for Today and Tomorrow, by Charles Kerr, Jr. . . . 765
Diesel Shops on Santa Fe Coast Lines—Part II 770

GENERAL NEWS **775**

WITH THE GOVERNMENT AGENCIES **783**

REVENUES AND EXPENSES OF RAILWAYS **800**

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service.

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The Week at a Glance

RATE RISE NEXT: The wage awards made last week by the arbitration boards and increases expected to come out of the pending emergency board proceeding will combine with the other advances in railroad operating expenses to create a situation wherein the carriers must have substantially higher freight rates if they are to realize net earnings adequate to carry out the large program of improvements and expansion that the public interest requires. The situation is epitomized by figures set out in this issue's leading editorial which says that the rate-increase application will launch the most important proceeding of its kind since 1920. The estimated cost increases indicate that the carriers have a case for advances averaging at least 25 per cent. The average revenue per ton-mile increased only about two per cent from 1940 to 1945 while the average wholesale price of commodities went up 34 per cent, and is still rising.

●

ROOM FOR ALL: Because the Westinghouse Electric Corporation strongly believes that there is now, and in the future, a definite place on American railroads for all kinds of motive power, it is lending its efforts without discrimination to the perfection of all types. That is the way the Company's policy was summed up by its consulting transportation engineer, Charles Kerr, Jr., in a paper presented at a recent meeting of the New York Railroad Club. One of this issue's illustrated feature articles presents Mr. Kerr's outline of what may be expected of reciprocating steam, geared - steam - turbine, steam-turbine-electric, Diesel-electric, gas-turbine and electric locomotives.

●

LETTERS TO LEA: The House interstate commerce committee is still receiving replies to the "questionnaire" which it distributed some time ago in connection with the comprehensive transportation inquiry sponsored by its chairman, Representative Lea of California. Among recent respondents were the Transportation and Communication Department of the United States Chamber of Commerce and the Air Transport Association. The former suggests a "broadening and strengthening" of the statement of national transportation policy, but remains silent on some issues raised by the committee's "questionnaire." A. T. A. defends the "modest" subsidies now received by the "scheduled air transport industry" and reiterates its opposition to the "integration" idea in the transport field. The statements, along with another from the Federal Transportation Association, are reviewed in this issue's news pages.

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150,000 CARS: With A. A. R. recommendations on the matter before them, the railroads are considering an equipment-buying program which will push the number of new freight cars on order to a total of from 125,000 to 150,000. This was revealed by L. M. Betts when he stated "unqualifiedly" at this week's Rochester, N. Y., meeting of the Atlantic States Shippers Advisory Board that the carriers "propose to provide sufficient cars to protect the traffic offered them to the full extent of their ability." Meanwhile, Mr. Betts called attention to the fact that 65,000 cars are already on order or in the process of being ordered; but deliveries remain "problematical" as a result of material shortages and labor uncertainties.

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BULWINKLE OPPOSITION: The Bulwinkle bill to exempt carrier rate-making procedures from the anti-trust laws remained under attack at Senate interstate commerce committee hearings subsequent to those at which Governor Arnall of Georgia laid down his heavy barrage, as reported in last week's issue. At the later sessions covered in a news story herein, the additional opposition presentations were highlighted by the appearance of Secretary of Commerce Wallace, and they included also the protests of Wendell Berge, chief of the Department of Justice's Anti-Trust Division; one of his predecessors in that job, Thurman Arnold; and C. E. Childe, former member of the defunct Board of Investigation and Research.

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LOW WATER: An editorial herein emphasizes again the need for positive and persistent instruction to insure that locomotive crews, faced with low-water emergencies, will promptly take the fire-dumping action essential to safety. Of recent boiler-explosion accidents offering evidence of what preceded the ultimate disaster, only one presented clear indications that defective appliances may have been a contributing cause. Thus the need for continuing efforts to overcome the predominant cause — the psychological factor which tempts enginemen to procrastinate as they feel the urge to maintain schedules.

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Man of the Week

MARTIN W. CLEMENT, eleventh president of the Pennsylvania, which is 100 years old today, April 13. The centennial is commemorated in this issue by an illustrated feature article which recalls some of the noteworthy events and accomplishments of the company's fruitful history. The article begins on page 756 while our editorial comment on the event appears on page 754.

CAPITAL OUTLAY: Class I roads in 1945 made capital expenditures of $562,980,000 for equipment and other improvements to railway property, according to the A. A. R.'s annual survey which is covered in a news story herein. Last year's outlay was the greatest since 1930, being up $2,868,000 from 1944. It included $314,779,000 for equipment and $248,201,000 for roadway and structures.

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EMERGENCY BOARD: If there is no postponement of the deadline agreed upon by the parties, President Truman should receive by April 20 a report from the emergency board which is sitting on the wage and rules case involving demands of the Brotherhood of Railroad Trainmen and Brotherhood of Locomotive Engineers. Closing sessions of the board's public hearings are reported in a news story herein. In their final arguments, management spokesmen contended that the stabilization program limits any wage increase to the 16 cents per hour which was awarded to other employees by the arbitration boards last week. Also they asserted management's determination to "clean up" rules of the "make-work" variety. Meanwhile the union representatives argued that the 16-cent arbitration award set no general pattern for wage adjustments in the industry. And they predicted that any attempt to make the rules changes proposed by management would "immediately cause widespread strikes."

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COST OF WAGE BOOST: In the latest issue of its "Monthly Comment," the I. C. C.'s Bureau of Transport Economics and Statistics has developed figures showing the cost to Class I roads of a wage increase averaging the 16 cents per hour awarded by the arbitration boards. The figures show that if the total man-hours paid for in 1946 equals those of 1945, the increase would add $658 million to the current year's wage bill. Further computations show that the $658 million is equivalent to 7.4 per cent of the 1945 operating revenues, thus leaving the "implication" that if the wage adjustment had been in effect throughout last year it could have been offset if revenues had been 7.4 per cent greater. Meanwhile the 16-cent increase would make this year's average straight-time hourly earnings 49.2 per cent higher than the 1939 average. Our news story on the "Comment" gives further details of the foregoing while reporting also on other interesting observations of the Bureau.

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DIESEL SHOPS: One of this issue's illustrated feature stories is Part II of the two-part article describing the extensive facilities provided by the Santa Fe for servicing and repairing the Diesel-electric locomotives in road freight service on its Coast Lines. The story begun in last week's issue is thus completed with a detailed description of the new maintenance building and servicing facilities that have been constructed at Barstow, Cal. The installation, as our reporter saw it, is in every respect an outstanding example of up-to-date practice in design and construction.

CAR LIFE PROTECTION

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RAILWAY AGE

Railways Must Have Advances in Rates

The Interstate Commerce Commission will soon be confronted with the most important case for advances in freight rates since 1920. In some respects the situation the railways are facing is similar to that in 1920; in other respects, widely different. As in 1920, they are facing huge increases in costs due to large advances in wages and in the prices of everything they have to buy—some advances in prices, as in the case of steel, already in effect; others, certain, as in the case of coal, excepting in amount. They are not, as in 1920, being turned back from war-time government operation with large deficits, as well as current and prospective huge increases in costs, requiring to be offset. In 1920, after the Railroad Labor Board awarded an advance in wages comparable with that awarded last week, the Commission, with little opposition from shippers, promptly authorized advances in freight rates ranging, in different territories, from 25 to 40 per cent.

Projection of railway prospects must be based on incomplete statistics for the first quarter of 1946. Carloadings declined 6.5 per cent in the first quarter. When they declined 8.4 per cent in the first two months of the year, ton-miles declined 15 per cent, or to 95 million. This, however, was more traffic than the railways ever handled in the first two months of any year prior to 1943, and *seems* to indicate there is no likelihood of a decline of traffic to the pre-war basis. Net operating income (after taxes) of $129 million earned in January and February was at an annual rate of about $1,050 million—a not unsatisfactory showing. But—

(1) The increases in wages and payroll taxes of about 17 per cent due to the arbitration awards will cost about $615 million annually.

(2) Increases in other operating expenses already made or in immediate prospect must be considered. Wages are about 56½ per cent of operating expenses. Cost of fuel, materials, supplies and miscellaneous is about 31 per cent of operating expenses, or in 1944 almost $2,000 million. The aggregate increase in the cost of these things probably will be relatively as large as in the increase in wages—or around $340 million a year.

(3) The foregoing estimated advances in wages and prices combined would almost wipe out annual net operating income at the rate at which it was earned in the first two months of the year, although the freight traffic handled was almost 50 per cent larger than in the first two months of 1929 or 1941.

On the basis of these estimates the railways have a case for advances in freight rates averaging at least 25 per cent. Does this seem large? Average railway revenue per ton-mile was about 2 per cent higher in 1945 than in 1940. The average wholesale price of commodities was 34 per cent higher in December, 1945, than in December, 1940; and prices, including those the railways must pay, already have increased further in 1946, and will increase still more.

Meantime, because of changes from war-time to peace-time conditions and practices, the railways, in spite of the decline of traffic, are having difficulty in handling it. Director of Defense Transportation Johnson recently has urged them to acquire 150,000 new freight cars as rapidly as practicable.

The railways must have adequate net earnings in order to carry out the large program of improvements and expansion that the public interest requires. A large advance in freight rates obviously is required to enable them to make the necessary net earnings.

Little Improvement In Crosstie Production

Although preliminary reports from ten large producer-members of the Railway Tie Association show an encouraging upturn in tie production east of the Rocky Mountains during the month of February, thus bringing producion for the first two months of this year approximately 40 per cent ahead of the corresponding period of 1945, there is little cause for cheering. Comparison with 1945 distorts the picture because the production curve reached a low in January, 1945, and dawdled along for the following six months. January-February production in 1946 was nine per cent less than in 1944, approximately 25 per cent less than in 1943, 20 per cent less than in 1942 and 16 per cent below that for the first two months of 1941.

Inventories as reported by these same producers on the first of March, 1946, were approximately 24 per cent greater than on the same day last year but 10 per cent less than for 1944, seven per cent less than in 1943, about 23 per cent less than in 1942 and fully 34 per cent below inventories of March 1, 1941.

One producer's estimate is that over-all production now approximates 65 per cent of requirements for crossties, and the production of switch ties has been reduced to barely 10 per cent of requirements. Spring and early summer weather may boost the production of ties to a limited degree, but not in proportion to demand. Any possible increase in the production of switch ties appears to be stymied by present O.P.A. price structures.

Under the circumstances, many railways are faced with critical shortages of treated ties for installation in 1946. Seasoned stocks awaiting treatment are badly depleted, and because of the strictly limited stocks that will reach the treating stage in 1946, many roads may be forced to extend artificial seasoning methods to provide track maintenance forces with even a limited ratio of their requirements.

The Pennsylvania's First Hundred Years

The Pennsylvania Railroad came into corporate existence on April 13, 1846; and an illustrated article in this issue recalls some of the noteworthy events and accomplishments of the company's fruitful history. It is strange, in such a country as this—known throughout the world for its economic and industrial preeminence—that so much more attention is usually devoted to political history than to business and industrial history.

Most people actually grasp only those things which they can sense in the concrete. To such persons the Abraham Lincoln of the ordinary history books is likely to be as shadowy a figure and as far off as Julius Caesar. But when Lincoln appears in words and photographs in association with such a familiar object as a train; or when General Bedford Forrest's exploits are reported (as they are in the recent biography by Colonel Robert Henry) in terms of his activities as a railroad wrecker—then, to a railroad man at least, these historical characters really "come to life." History ceases to be mere legend and becomes real. Business and industrial history has left physical traces all around every American, wherever he lives or wherever he works, and history can be given a significance even to the unimaginative if it is approached in terms of familiar surroundings.

Business History vs. Political History

The question might even be raised: What history is it more important for people to know—that of Missouri or of the Missouri Pacific; or that of the State of Pennsylvania or of the Pennsylvania Railroad? Even to raise such a question is suggestive of heresy, and perhaps it would be politic not to answer the question in the railroads' favor. Nevertheless, a number of persuasive reasons for such a reply might be advanced. For example, a student of the history of a railroad would, in his examination of its relations with governors, legislatures, courts and political leaders, have to acquire incidentally a rather complete political history of the territory it serves. In addition to that, if it were a railroad man doing the studying, his efforts would make him a better railroad man, because he would learn the processes of trial and error lying behind every railroad device and practice—a knowledge which would enable him to avoid the repetition of time-worn mistakes. In short, a study of the history of a railroad or other important industry will carry along with it a reasonably complete complement of political history; while the study of political history alone yields no by-product at all of knowledge in matters of most concern to people, and, consequently, easiest for them to understand—that is, of the means they use to earn a living.

The recent intensification of interest on the part railroads and railroad men in the history of their industry is, thus, a highly favorable development, alike from the point of view of the industry itself and of that of effective citizenship. Only those persons with some knowledge and appreciation of the accomplishments of the past are likely to understand the present, or to be able to conduct themselves with wisdom toward the future. In this connection, as part of the commemoration of its centenary, the Pennsylvania has retained the services of the engineering firm of Coverdale & Colpitts to prepare a history of the property, covering fully its engineering and technological development.

Most people, when and if they read history, do so because they find it entertaining—that is, for the same reason that they attend the movies or spend time with fictional detectives. The ultimate justification for the study of history, however, must be the acquisition of wisdom—learning from the past how to deal with the problems of the present and how to prepare for those of the future. Thorough study of the history of any institution, political or industrial, should enable the student to arrive at some "lessons" in the form of general principles, explaining how the enterprise has succeeded or failed, and which he can use in the guidance of his own behavior.

One painstaking student of the Pennsylvania Railroad has mentioned two such observations which he has distilled from his inquiry into that company's notably successful history. One is that its principal officers have usually been men of education—not in the narrow sense

that they have always been "college men," not all of whom are invariably really educated—but rather in the genuine sense that they have been men of broad interests and understanding, beyond the mere grasp of their immediate jobs. This observer also notes that the management of the Pennsylvania has usually been able to discern the major managerial problem of its time, and to proceed with vigor and courage to act upon it. They were not timid men who pushed this railroad across the Alleghenies with the primitive tools of a century ago; nor who, to come down to a more recent time, pressed on to complete the electrification of the line to Washington in the middle of the greatest depression in the country's history.

As subsequent events proved, though, it would have been just too bad for Uncle Sam in both instances if certain railroad men had not been a great deal more daring or foresighted than circumstances appeared to warrant.

The purpose of these few words is not, however, to epitomize railroad history, but only to invite attention to what a pleasurable and profitable undertaking such effort can be for the individual railroader. The occasion of a centennial celebration is opportune for a reminder of the fruitfulness of such endeavor; and it is heartening to see the Pennsylvania making the most of it. That is one very good way of insuring the company another hundred years as productive of good for all concerned as the past hundred have been.

Crown Sheets Continue to Fail

Despite the lack of evidence of contributory causes from defective water level indicating appliances or boiler feeding equipment, locomotive boilers continue to drop crown sheets due to low water—with the customary toll of life and limb and great property damage. Reports on four out of eight accidents which occurred during the period August through December, 1945, offer no evidence of what preceded the ultimate disaster; in one case the engine crew is known to have had no warning; another accident presented a clear case of procrastination on the part of the engine crew in acting on a known water condition, and in another case the crew took partial but not complete action to prevent the ultimate failure. In only one case was there clear evidence that defective equipment may have contributed to the accident.

This emphasizes what has been pointed out frequently in these columns; that is, the apparent preponderance of psychological factors over defects in the equipment as causes of boiler explosions. The seriousness with which these conditions are regarded by some railroads is evidenced by illustrated warnings and instructions for dealing with low water conditions which are being posted in locomotive cabs. While excellent in themselves, they must be supplemented by some form of positive and persistent instruction in order that, when the low water emergency presents itself, the decision essential to safety will not be overpowered by the habitual urge to maintain schedules.

The War of Materials Is Back

For those in the engineering and maintenance departments who had thought that victory would bring quick relief from the severe war-time shortages in essential materials—especially structural steel, rail and fastenings, and timber and lumber—there is little but disappointment in present conditions. Rather than the rapid improvement they had reason to expect, government pricing policies, strikes, the excessive demands from all classes of consumers, and now the drastic curbs on practically all building construction and repairs, other than housing for veterans, have brought about a situation that has grown progressively worse, with little hope for early improvement unless the railroads assert themselves to secure their essential needs.

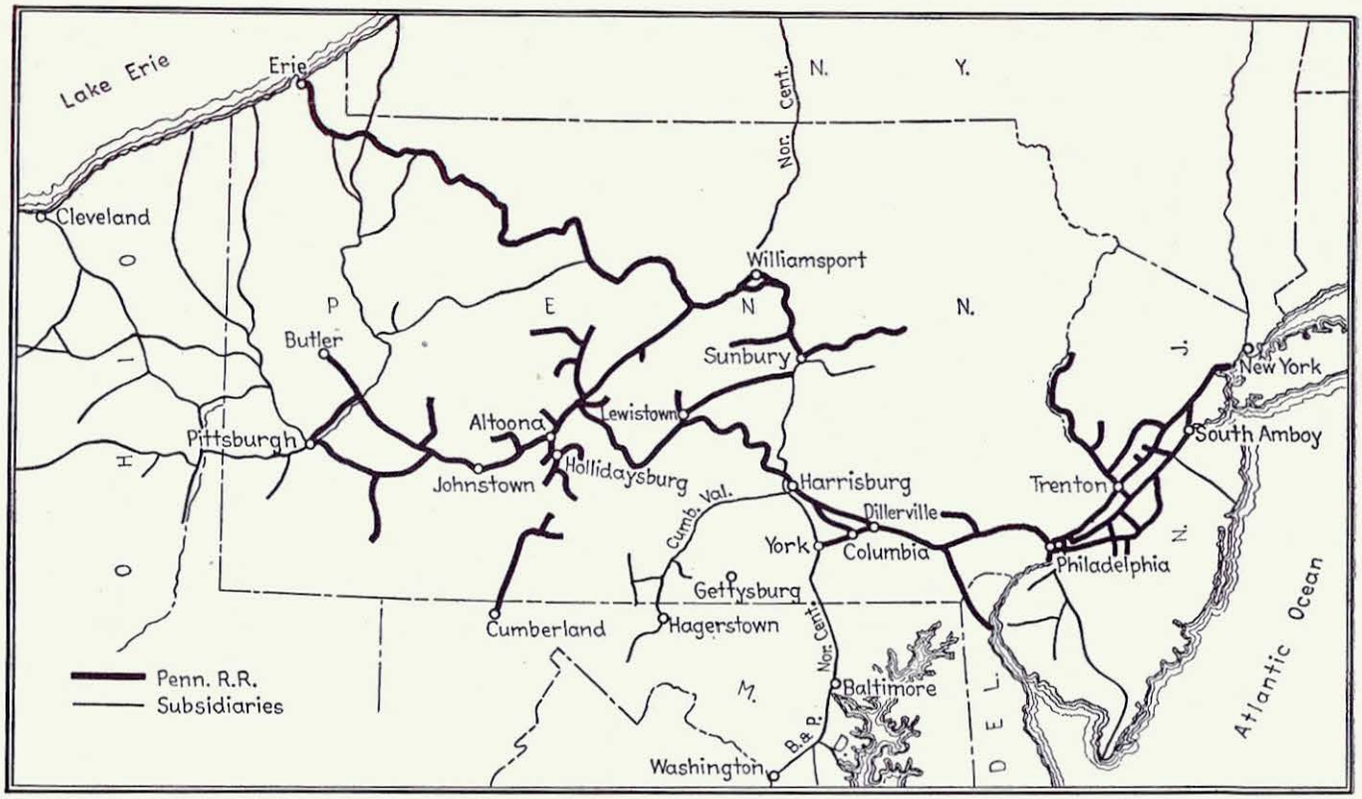
For engineering and maintenance officers, who helped fight so successfully the railroads' battle to provide adequate war-time transportation, working on a "shoestring" basis of material supply, the situation is more serious than just disappointing, as they realize the urgent needs of the fixed properties, arising from losses through wear and general deterioration in a prolonged period when adequate current restoration of plant was impossible.

First among their concerns is their need for replacement rail, one well-informed source estimating that rail deliveries during the year will not exceed 1,600,000 tons, in the face of conservative estimates of needs exceeding 2,250,000 tons. And, to make matters worse, delayed deliveries are certain to throw rail-renewal and related track-maintenance programs out of normal schedule on most roads, forcing a disproportionate part of the work into the late fall when it will interfere with readying the fixed properties for winter.

In the recent building restrictions set up by the Civilian Production Administration, the railways are now to be restrained from making many desirable improvements in, or repairs to, their buildings. Indeed, plans for improvements involving millions of dollars in expenditures have already been shelved. The railroads have no quarrel with veterans, who must be provided with homes, but they may well have a quarrel with the C.P.A. which, under its restrictions, has placed essential railway buildings in the same category as juke parlors and movie palaces.

For their needed rail and rail fastenings, not now under control of federal authorities, the railroads must prevail upon the steel companies to meet essential requirements. For building materials the railroads now have to depend upon the Civilian Production Administration as they did upon the War Production Board during the war. In both cases, the railroads will need to marshal their facts well to substantiate their requests; and, if necessary, they will have to be insistent upon getting what they ask for. If those in whose power it is to say "yes" or "no" do not lend an understanding ear to the individual railways, then the carriers should present their case collectively.

There is much track and building work that can still be done effectively by the railroads. They will have a better case for extending their rehabilitation efforts if, first, they demonstrate that they are doing all they possibly can do with supplies which continue to be available.



The Pennsylvania Railroad as it was in 1875, with connecting subsidiaries

The Pennsylvania Is 100 Years Old

Railroad has been a main reliance for national defense and for heavy civilian traffic as well—Dividends paid each year

THE PENNSYLVANIA RAILROAD is one hundred years old today, April 13, the company having come into existence by an act of the legislature of the Commonwealth of Pennsylvania granting it a charter, which act was approved by Governor Shunk on April 13, 1846. The purpose of the company was to parallel and supplement the service of that portion of the commonwealth's "main line of public works" between Philadelphia and Pittsburgh which consisted of canals and inclined planes. The new company, that is, was to provide railroad service between the Susquehanna river at or near Columbia, Pa., and Pittsburgh—since a railroad between Philadelphia and Columbia already existed, under state ownership, as a part of the "main line of public works."

This "main line" had been the answer of Philadelphia and the Commonwealth of Pennsylvania to the commercial challenge of the state and city of New York in the completion, in 1825, of the Erie canal—which provided the first economical through transportation service between the eastern seaboard and the rapidly growing Middle West, and gave the port of New York the primacy which no other trade center has yet been able to surpass. The commonwealth-owned "main line" from Philadelphia to Pittsburgh was completed in 1834 and comprised the following sections:

Philadelphia & Columbia Railroad, 82 miles
Eastern Division canal, 172 miles, from Columbia to Hollidaysburg
Portage Railroad, 36 miles, from Hollidaysburg to Johnstown
Western Division canal, 104 miles, from Johnstown to Pittsburgh

The Eastern Division canal followed the Susquehanna river from Columbia to the mouth of the Juniata above Harrisburg, and thence up the valley of the Juniata to Hollidaysburg. The Portage Railroad, in its 36 miles between Hollidaysburg and Johnstown, consisted of 11 level stretches of line and 10 inclined planes. The ascent from Johnstown to the summit was 1,171 ft. in 26 miles and the descent from the summit to Hollidaysburg was 1,399 ft. in 10 miles. Cars on the inclined planes were moved by cables activated by stationary engines. Locomotives were used on the longer level stretches and horses supplied the motive power on the shorter ones.

Actual construction of the Pennsylvania Railroad began in 1847, westward from Harrisburg. Construction was completed to the eastern terminus of the Portage Railroad in 1850. The Western part of the Pennsylvania's line to Pittsburgh was completed to a connection with the western slope of the Portage Railroad in 1852, and all-rail transportation was available thereafter from

In the preparation of this article the principal sources have been: Annual reports of the company, especially that for 1945; data and photographs from the P. R. R.; three standard histories of the Pennsylvania Railroad—by W. B. Sipes (1875), W. B. Wilson (1899) and H. W. Schotter (1927); the biographies of Abraham Lincoln by I. M. Tarbell and J. G. Randall; Edward Hungerford's Story of the Baltimore & Ohio Railroad; Margaret Leech's Reveille in Washington. Several of the illustrations are from the personal collection of W. A. Lucas, associate editor, Car Builders' Cyclopedia.

Philadelphia to Pittsburgh. The Portage Railroad continued to be used, however, as a connecting link between the eastern and western sections of the Pennsylvania Railroad until 1854, when the railroad completed its own line over the summit of the Alleghenies. The Portage Railroad was virtually rebuilt during the 'fifties, but in 1857 the state sold all its "main line of public works" to the Pennsylvania Railroad, which closed the Portage Railroad in the same year.

Rail connection between the Pennsylvania Railroad proper (i. e., westward from Harrisburg) and the state-owned Philadelphia & Columbia was secured over the line of the privately-owned Harrisburg, Portsmouth, Mt. Joy & Lancaster Railroad. This line ran southeasterly from Harrisburg, forking at Royalton, with an eastern branch connecting with the Philadelphia & Columbia at Dillerville and the west branch proceeding to Columbia. It was by way of Dillerville that through train service from Philadelphia to Harrisburg and the west was provided. The Pennsylvania acquired the Mt. Joy line by lease in 1860, so that, from that time onward, service across the state was provided by one railroad under unified control and operation.

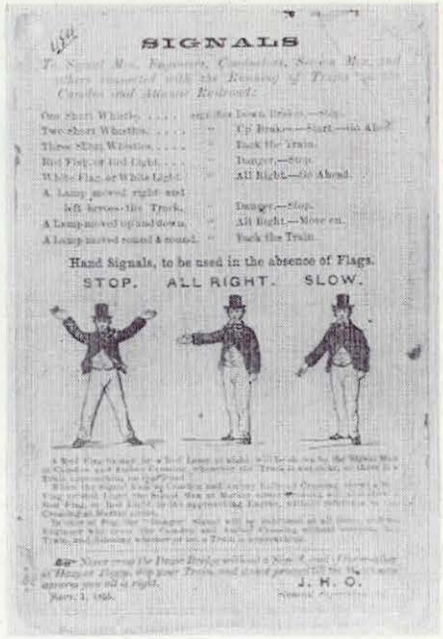
The Pennsylvania expanded westward from Pittsburgh, first, by extending financial assistance to lines being built in that territory which agreed to exchange traffic with it and, later, by leasing these principal western connections. Direct lines reached into Cincinnati and Chicago in 1869 and to St. Louis in 1873.

The railroad also expanded eastward and southward, acquiring the United New Jersey Railroad & Canal Company's lines between Philadelphia and New York in 1871, the Northern Central (Baltimore to Harrisburg and northward to Sunbury, Pa.) in 1870, and the Philadelphia, Wilmington & Batlimore (between the cities named) in 1881. The Pennsylvania-controlled Baltimore & Potomac established through service to Washington, D. C., in 1873. Entrance into Louisville and Cleveland was secured in the early 'seventies by lease of existing lines. Subsidiary lines reached Lake Erie at Cleveland and Erie by the early 'seventies.

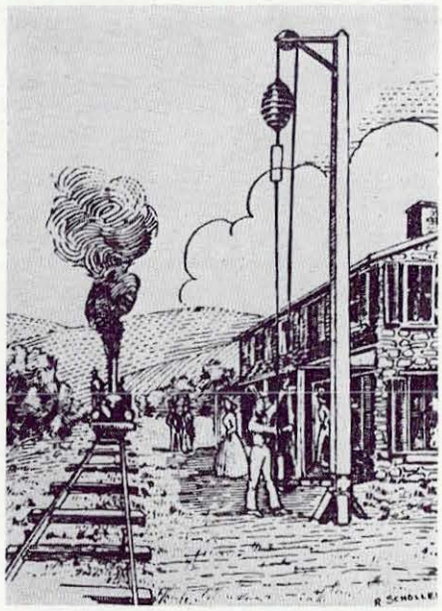
Like other early railroads, the Pennsylvania found plenty of problems to solve apart from that of financing and building its inter-city lines. Station and terminal facilities were, naturally, limited for the light traffic expected to come to the railroad immediately upon its completion; but the reduction in transportation costs and improvements in service were so enormous that traffic growth quickly required improved terminal facilities. The Pennsylvania's situation in this regard was unusually severe in Philadelphia, because the state-owned "main line" railway (the Philadelphia & Columbia) had not, directly, handled either freight or passengers. It merely, for a toll charge, moved the cars which were owned by forwarding companies, which collected the freight and passenger charges from customers. The Philadelphia & Columbia did not even have its own freight and passenger stations; such facilities as were provided being operated by the forwarding companies.

The Pennsylvania completed in 1854 a freight station at 13th and Market streets, Philadelphia, and a passenger station at 11th and Market streets. Horse-car tracks laid in Market street connected these, and other freight stations which were subsequently provided on Market street, with West Philadelphia, where trains hauled by steam locomotives were made up. The Philadelphia & Columbia line originally had an inclined plane west of the Schuylkill river bridge in Philadelphia, and a similar inclined plane let the railroad down to the Susquehanna river at Columbia. Short sections of new line in 1850 eliminated both these inclined planes, which imposed a serious impediment to prompt movement of traffic. The main passenger station was relocated in West Philadelphia in 1864 and no passenger station was provided again in the center of the city until 1881, when Broad street station (now scheduled to be abandoned) was open to service.

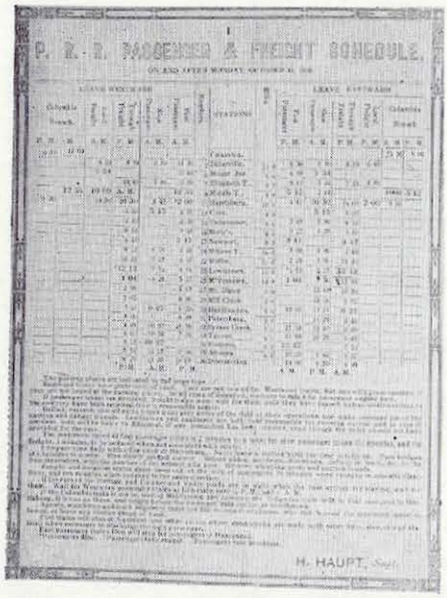
When railway lines entering a city from different directions were united into an integrated system under common ownership, the problem usually arose of establishing a physical rail connection between the two lines. At the time of the Civil War through railroad service between New York and Washington was interrupted both at Philadelphia and Baltimore because the lines to the north and south of these cities were not physically connected. Connection between the Pennsylvania Railroad proper, in West Philadelphia, and the line to New York, which terminated in the Frankford section of the city, was completed in 1867 by the construction of the 7-mile "Connecting Road." Connection between the Pennsylvania and the Reading Company in Philadelphia was established in 1863 and with the Philadelphia,



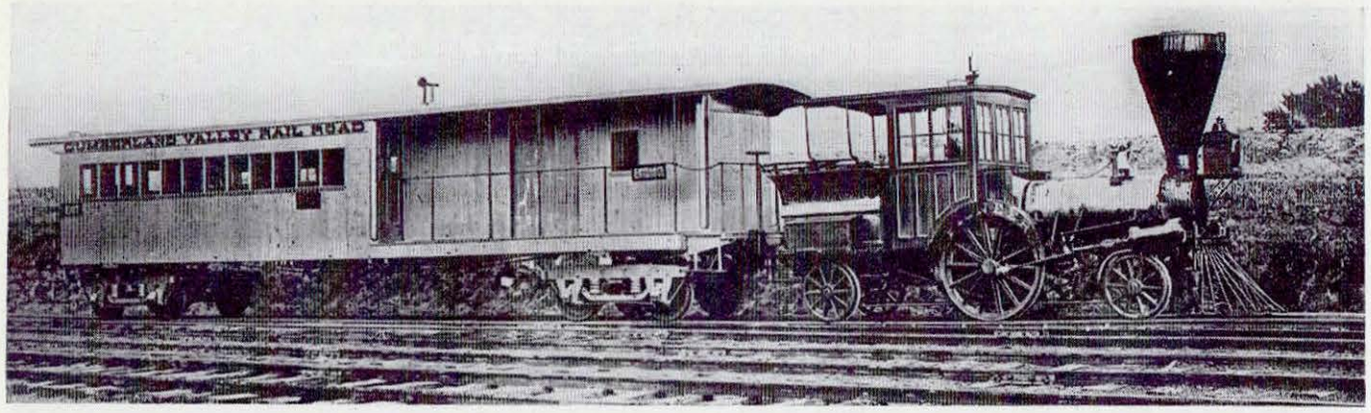
Instructions on hand and whistle signals, Camden & Atlantic, 1855



Early "highball" signal on the New Castle & Frenchtown (part of P. W. & B.) in 1831



First P. R. R. timetable, Columbia to Altoona, dated October 14, 1850



The Cumberland Valley's "Pioneer," 1851-1890

Baltimore & Washington (then a separate company) in 1866—along the west bank of the Schuylkill river.

In 1873 a tunnel was completed in Baltimore which connected the Northern Central with the new Baltimore & Potomac Railroad, which made possible through train service (without an intervening ferry trip or horse-hauled interlude) between the north and Washington, D. C. The B. & P. also established a connection across the Potomac at Washington with lines in Virginia. A tunnel connection with the Philadelphia, Wilmington & Baltimore at Baltimore also permitted through service by direct rail to the north by way of Wilmington. The P. W. & B. had crossed the Susquehanna between Havre de Grace, Md., and Perryville by car ferry prior to 1866, but in that year the river was bridged.

The Pennsylvania was not a very old railroad when parts of its lines became actively involved in the Civil War. The Cumberland Valley line, extending from Harrisburg to Hagerstown in Maryland, was repeatedly cut and its property damaged by Confederate forces, and it was used to get badly needed munitions to General McClellan at the time of the battle of Antietam.

Almost immediately after the outbreak of the war, Maryland sympathizers with the Confederacy damaged bridges on the railways in that state and cut telegraph lines, virtually isolating the city of Washington from the rest of the country. Thomas A. Scott, a vice-president of the Pennsylvania, was summoned to Washington to assist in reestablishing communication. The line of the Philadelphia, Wilmington & Baltimore between Havre de Grace and Baltimore having been cut, that railroad had, as a make-shift, begun operating its train ferry (ordinarily in service across the Susquehanna river between Perryville, Md., and Havre de Grace) directly from Perryville to Annapolis. At that time the Baltimore & Ohio line from Baltimore was the only railroad into Washington, but there was then a railroad from Annapolis to a point midway between Baltimore and Washington on the B. & O. This line also had been cut by Confederate sympathizers, but Mr. Scott, working westward with repair forces from Annapolis, soon had service going again; and railroad service to the north from the nation's capital was restored.

Mr. Scott was commissioned a colonel in May, 1861, and in August of the same year was named Assistant Secretary of War. Resigning in the following year and returning to the railroad, he was called again into military service as a colonel for a short period in 1863, especially to improve army transportation arrangements in the west and in connection with the military campaign in Tennessee.

The Altoona Works

Altoona was chosen as the location for the Pennsylvania's principal shops when the road was built. Because the company has followed the practice of building a great deal of its locomotives and rolling stock, Altoona Works has become even larger than the plant which, in any event, would be required as the main repair shop for so large a railroad.

One of the noteworthy features of Altoona Works is its locomotive testing plant. This plant was set up by the Pennsylvania originally at the world's fair in St. Louis in 1904 and, thereafter, was moved to Altoona, where it has been in service ever since—an installation which has no complete counterpart elsewhere on the North American continent. There, for many years, all types of the company's power—and, at times, those of other railroads also—have been tested, yielding through the years an enormous volume of scientific data bearing on locomotive design, which has been a unique contribution by this railroad to the advancement of knowledge of railroad motive power, not only to its own advantage but to that of the industry generally.

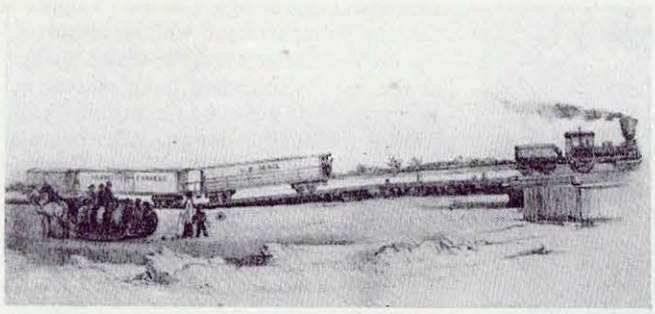
The Pennsylvania has been especially noted for its contributions to the technology of railroad transportation and believes it may fairly lay claim to the following "firsts": Steel rail, utilization of the air brake, block signals, the use of the telephone in the movement of trains, the train phone now in use on moving trains, steel cars, the operation of freight trains on regular schedules, and many advances in the field of motive power, including the recent direct-drive steam turbine locomotive.

In 1868 the railroad, realizing the need of standardizing locomotive design in the interest of greater efficiency and operating economy, prepared drawings for a new series of locomotives. From that time on, with few exceptions, locomotives on the railroad conformed to standard designs. Since 1868, dozens of different types of standard locomotives have operated over the railroad. Outstanding among these may be mentioned the well-known Pacific-type "K-4," the high-speed passenger engine which, for a number of years, performed the railroad's major job in hauling fast, through passenger trains. Another similarly well-known design which has played an important part in hauling fast, heavy freight trains has been the "M-1" Mountain-type locomotive.

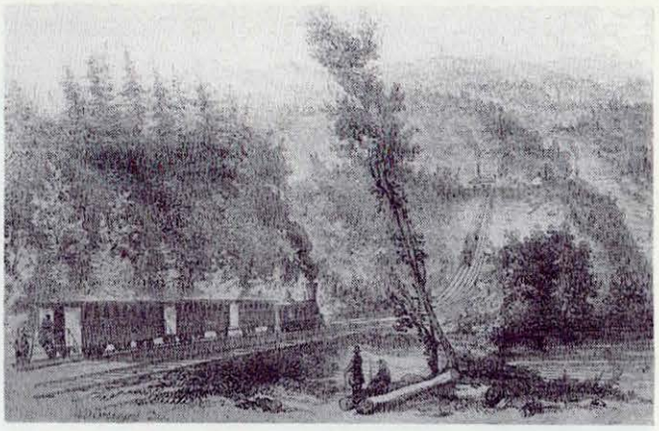
The new turbine locomotive carries forward the company's tradition of constantly progressing its motive power development. This engine was designed and constructed by the Baldwin Locomotive Works and the Westinghouse Electric Corporation in collaboration with the railroad.

The "S-2" (turbine) with its loaded tender weighs nearly 500 tons and is 123 ft. long. The turbine develops 6,900 shaft horsepower, providing power at the tender coupler sufficient to pull a full-length passenger train at 100 m. p. h.

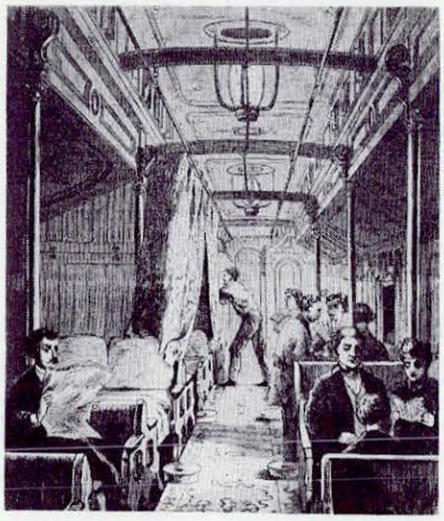
Another locomotive of recent design



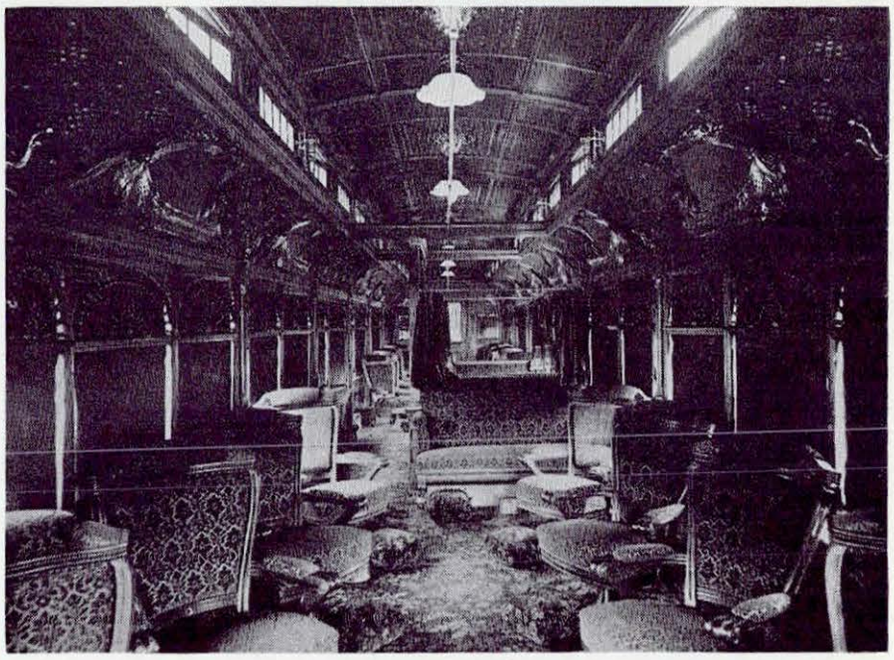
The Susquehanna at Havre de Grace froze over in 1852, tying up the P. W. & B. train ferry—so cars were crossed over on the ice by horse-power, locomotives being used to pull cars up from the river on either bank



An inclined plane on the old Portage Railroad over the Alleghenies

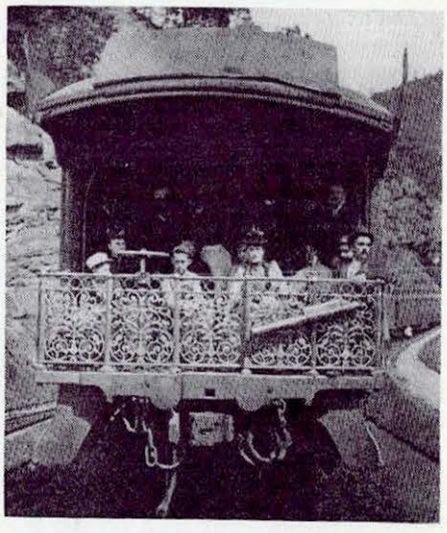


A New York-Chicago sleeper in 1870, the year Pullman took over on the P. R. R.

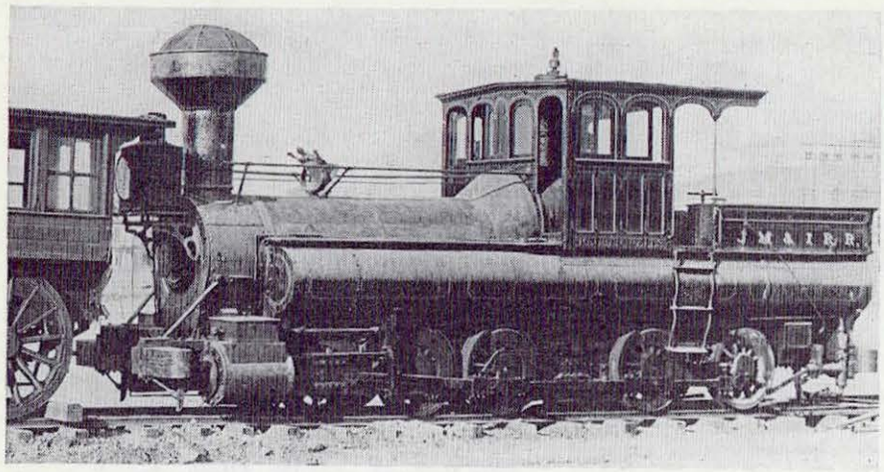


A parlor car of fifty years ago

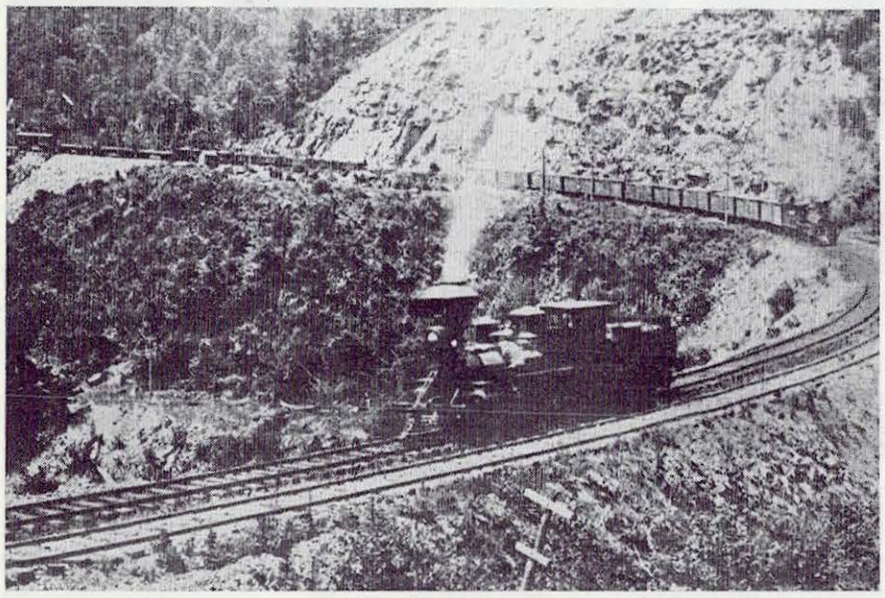
Harrisburg station in the 'seventies



Luxury travel atop the Alleghenies in the 'nineties



Above—Jeffersonville, Madison & Indianapolis "Reuben Wells," 1868—an effective worker on heavy grades. Below—Freight train descending horseshoe curve in the 'sixties



is the long streamlined "T-1." A multi-cylinder coal-burning steam passenger locomotive, the "T-1" has been operated at speeds up to 120 m. p. h. on the locomotive testing plant run at Altoona. Locomotives of this type are used in the Pennsylvania's fast East-West service west of Harrisburg. Fifty have been ordered; 22 are now in service.

Another new locomotive, the "Q-2," was designed for heavy, high-speed freight service, and is capable of pulling 125 loaded cars faster than 50 m. p. h. In its working range—that is, at speeds of more than 20 m. p. h.—the multi-cylindered "Q-2" develops greater power than any other steam locomotive ever built.

The P. R. R.'s "GG-1" is the most powerful electric passenger locomotive ever built and is the first to be streamlined. Weighing more than 477,000 lb., the "GG-1" is capable of hauling full-length passenger trains at sustained speeds of 90 to 100 m. p. h. The "P-5-a," another type of electric locomotive, is in general freight service. It weighs 394,000 lb.

The railroad also has a number of various types of Diesel-electric locomotives on order. One Diesel-electric now in service is designed for passenger train speeds up to 95 m. p. h. The locomotive consists of two 2,000-hp. units, each powered by two 1,000-hp., 12-cylinder Diesel engines.

The Pennsylvania is trying out all the latest designs for railroad motive power as they are developed so that each type may be utilized in that part of the Pennsylvania's service for which it is best adapted and for which it can be most efficiently and economically operated in improving service to the public. In keeping with its long-established policy of planning for the future, the road also is designing an altogether new type of powerful twin-turbine, 9,000-hp., high-speed locomotive to be known as the "Triplex" because of its unusual arrangement and design. In the "Triplex" the coal compartment will be ahead of the cab and boilers, and the water tender at the rear. Sixteen driving wheels in two sets, each geared to a turbine, will feature the engine design. The overall length of the "Triplex" will be 137 ft.

The Eleven Presidents

In the course of its first hundred years, the Pennsylvania has had eleven presidents, their terms of office having been as follows:

Samuel Vaughan Merrick, 1847-1849
William Chamberlain Patterson, 1849-1852
John Edgar Thompson, 1852-1874
Thomas Alexander Scott, 1874-1880
George Brooke Roberts, 1880-1897
Frank Thompson, 1897-1899
Alexander Johnson Cassatt, 1899-1906
James McCrea, 1907-1913
Samuel Rea, 1913-1925
William Wallace Atterbury, 1925-1935
Martin Withington Clement, 1935—

The first two presidents, Messrs. Merrick and Patterson, were prominent Philadelphia business men—not men who had spent their lives at railroading; the company and the industry at that stage were too young for many such men to be available. Mr. Merrick had been born in Maine, but was a prominent figure in the industrial and commercial life of Philadelphia when he entered upon the presidency of the new railroad. He was president of the Franklin Institute in that city, had built the local gas works, and was an active partner in a large manufacturing business. Since one of the principal needs of the new company was capital and since Philadelphia enterprise had so much at stake in the success of the new railroad—as a means of developing its trade with the west—it was natural and probably even necessary that a man who had the confidence of Philadelphia investors and business leaders head the company.

J. Edgar Thompson was chosen as the road's chief engineer and was given the task of selecting a route for the road's initial project—a line from Harrisburg to Pittsburgh. The location—following the Juniata and Little Juniata, thence over the Alleghenies with a tunnel at the summit, and down the valley of the Conemaugh and other small streams to Pittsburgh along the Monongahela—was selected. Then the question had to be decided, whether to build the railroad all the way through as one project—or, first, to construct eastern and western sections with the Portage Railroad connecting them. The estimated cost of the first alternative was $11,100,000, and of the second, $7,860,000; and the latter was chosen.

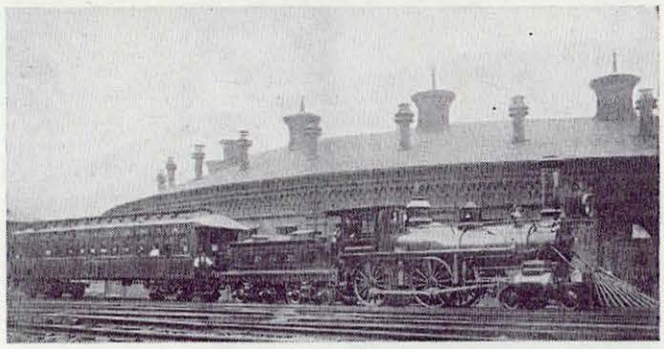
By 1849 the company had sold $5,500,000 of stock, and with construction progressing satisfactorily, Mr. Merrick resigned the presidency and was succeeded by Mr. Patterson. Hailing from Ten-

nessee originally, Mr. Patterson was also a prominent Philadelphia business man, with extensive experience in finance.

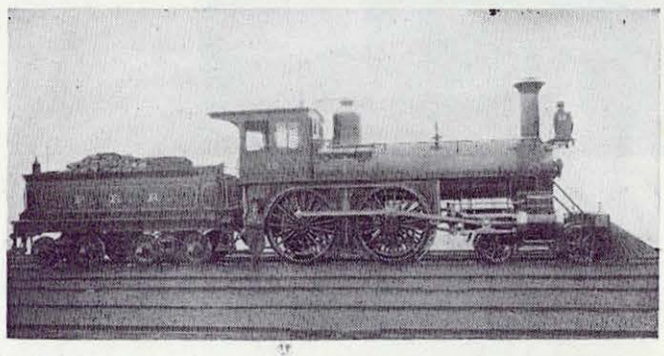
It was soon realized that reliance on the Portage Railroad as a part of the Pennsylvania's line to Pittsburgh was going to be accompanied by serious disadvantages, both because of delays to traffic, due to the unsatisfactory political management of the state-owned facility, and because its severe grades made the handling of livestock impracticable. The company was motivated also by the fact that the Baltimore & Ohio was building through to the Ohio river and it was believed that this inclined-plane link in the P.R.R. system would be a competitive handicap. In spite of the relative scarcity of funds, because of continuing construction costs on the western part of the line, the company decided to proceed without delay with the so-called "Mountain division," eliminating the Portage Railroad. All-rail service, Philadelphia to Pittsburgh (incorporating the Portage Railroad as part of the route), was opened in 1852, and service by standard railroad all the way was begun in 1854.

Mr. Patterson resigned the presidency in 1852 and Chief Engineer Thompson succeeded him, becoming the first lifetime railroad man to head the company, and one whose 22-year career at the head of the new company was to put a durable imprint both on the physical character of the property and its managerial pattern. Mr. Thompson had started railroad work at the age of 19, on a surveying job for the state-owned Philadelphia & Columbia Railroad. He subsequently did engineering work for the Camden & Amboy, and then became chief engineer of the Georgia Railroad, which employment he relinquished in 1847 to head the Pennsylvania's engineering department.

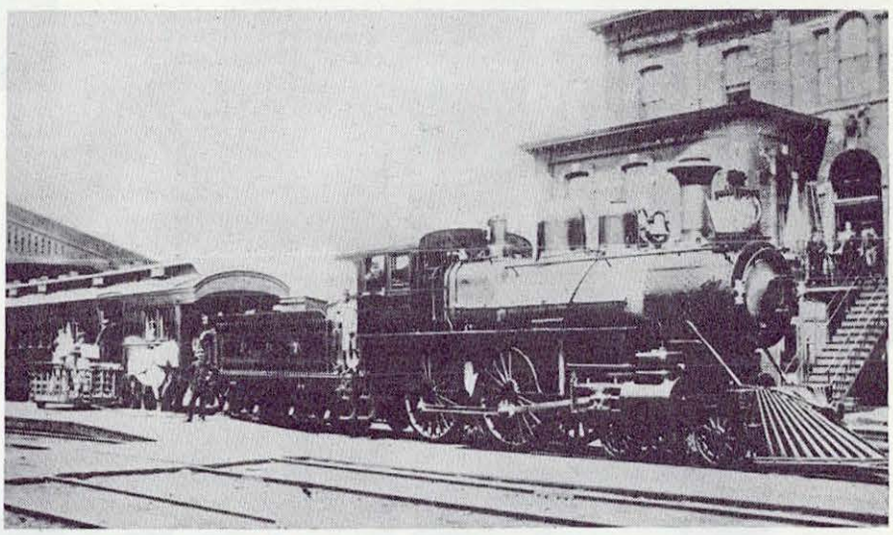
The company financed itself exclusively by the sale of capital stock until 1852-53, when a $5,000,000 first mort-



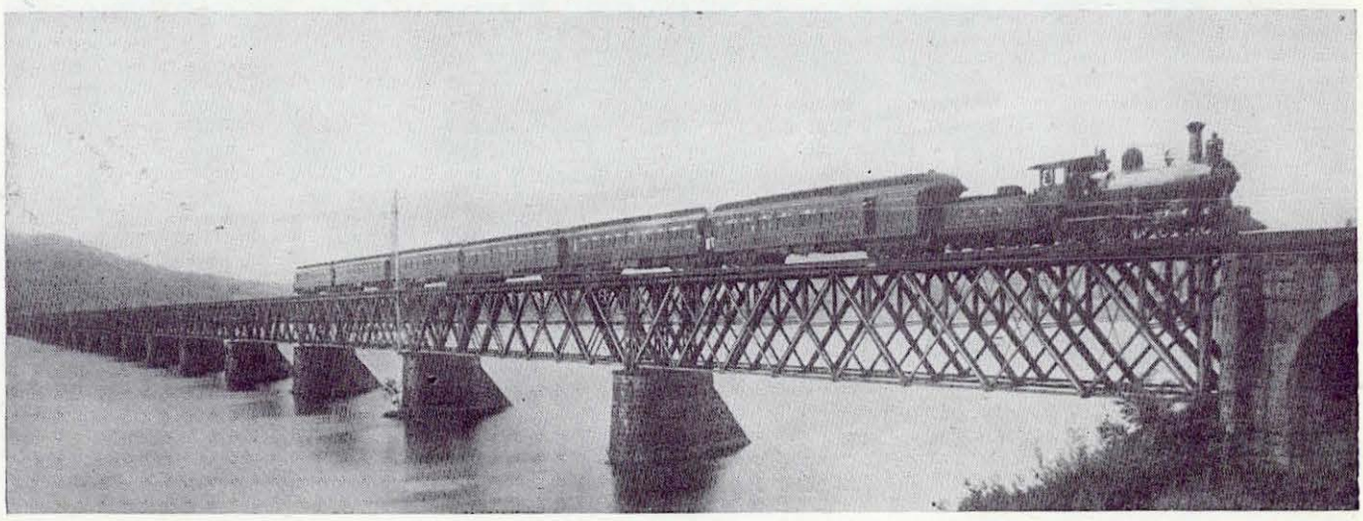
First train to be equipped with Westinghouse air brake (straight air), 1869

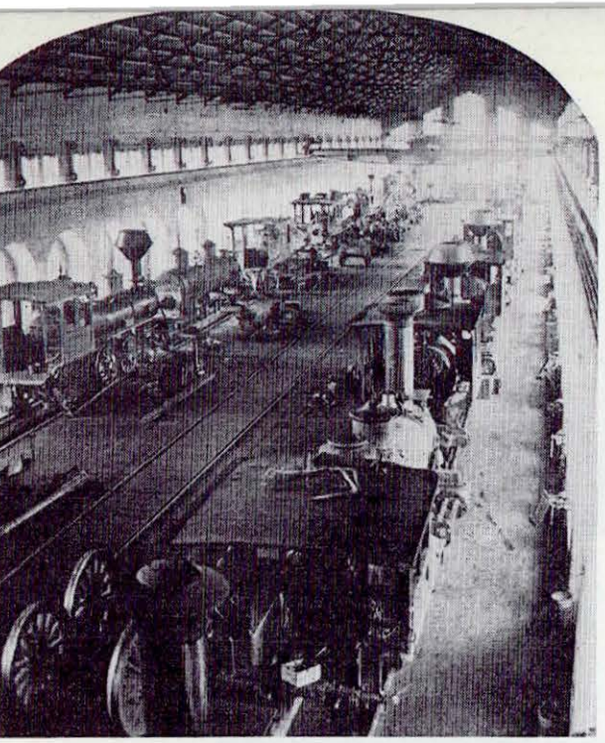


"Long Legged 10," built 1881 for fast passenger service on the New York division

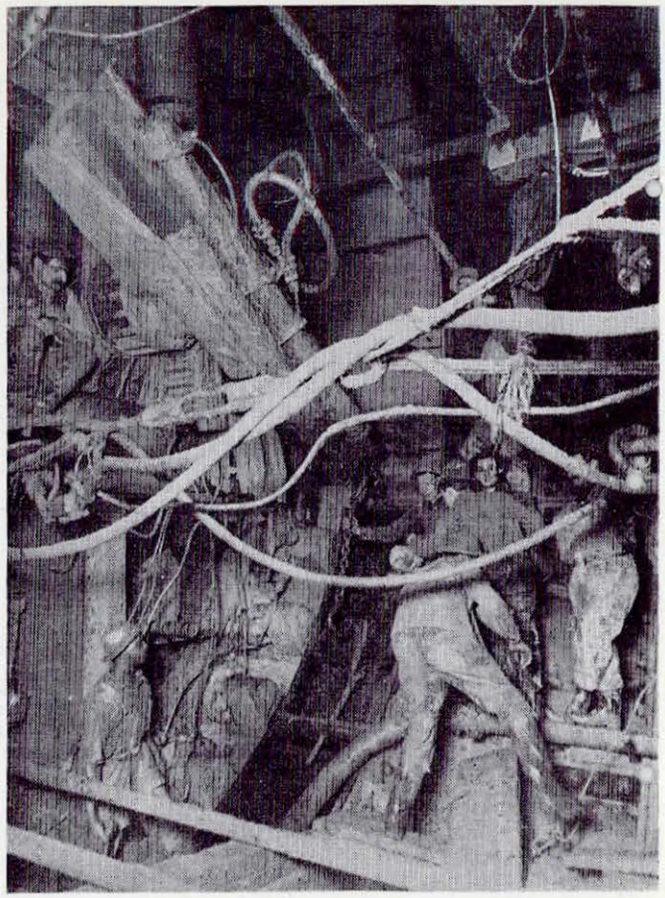


Above—An 1895 product of Altoona Works. Below—"Pennsylvania Limited" on Susquehanna bridge in the 'nineties

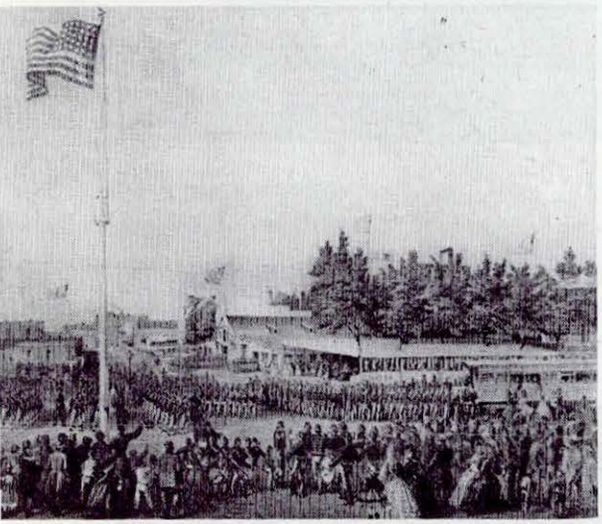




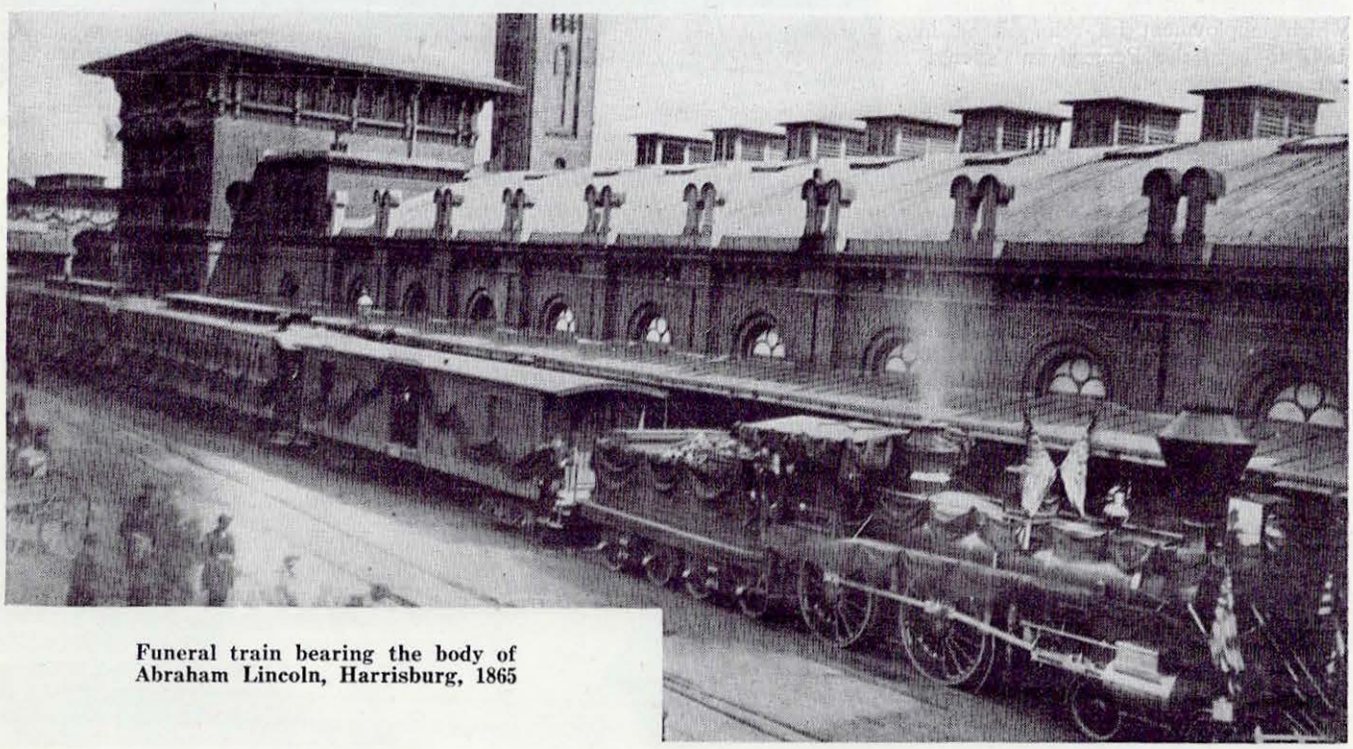
Erecting shop at Altoona in the early days



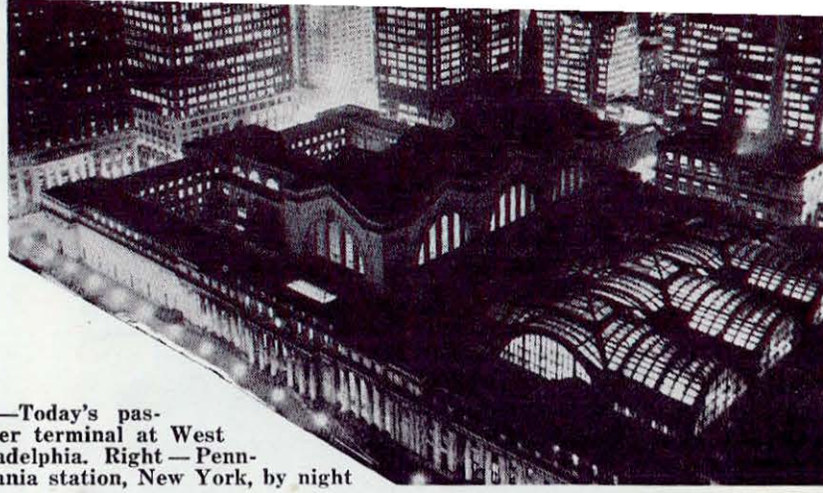
Tunneling under the Hudson to reach New York—work completed in 1910



"Refreshment saloon" for Union troops at railroad pier, Philadelphia, 1861



Funeral train bearing the body of Abraham Lincoln, Harrisburg, 1865



Left—Today's passenger terminal at West Philadelphia. Right — Pennsylvania station, New York, by night

gage (6 per cent) bond issue was sold. Even before the Pennsylvania Railroad proper was completed as a double-track line into Pittsburgh, the management foresaw that future prosperity would depend in large measure on westward traffic connections at Pittsburgh; and financial aid was, accordingly, extended to various western lines—most of which have since, by lease or purchase, become parts of the Pennsylvania system.

The first lines to receive such assistance from the Pennsylvania were companies which in 1856 merged to form the Pittsburgh, Ft. Wayne & Chicago. The constituent companies of what later became the Pittsburgh, Cincinnati, Chicago & St. Louis and other of the Pennsylvania's subsidiaries to the west, and northward to Lake Erie, were subsequently assisted in the same manner. A second mortgage 6 per cent bond issue totaling $5,000,000 was sold in 1855 and thereafter, providing the funds with which the company pressed forward its own construction projects, while assuring itself of profitable connections.

The Pennsylvania Railroad paid its first dividend, 4 per cent, in 1856—but stockholders had been getting interest from the outset, out of the construction account. As soon as funds were available, however, the company discontinued this practice and made these payments a charge on earnings. By 1863, the company's surplus account had grown to the point that it was possible to declare a stock dividend of 30 per cent. Stockholders had received an average of 6 per cent on their stock from the time they subscribed until 1862, and from 1862 to 1865 cash and stock dividends averaged 18 per cent. In 1867, the company's charter was amended to enable it to issue mortgage bonds in an amount not to exceed its capital stock; and a plan was adopted of paying stock dividends regularly, if earned; this being an expedient for raising equity capital for expansion without the necessity for formal sale of new issues.

The Pittsburgh, Ft. Wayne & Chicago —in which the Pennsylvania had an interest but which it did not control—began in the late sixties to interest itself in building its own line to the Eastern seaboard; in another move about this time the Erie Railroad came close to acquiring control of all the Pennsylvania's western connections. Impressed by this danger, the company leased the Ft. Wayne line for 999 years. Another line to Chicago was secured when the Pittsburgh, Cincinnati & St. Louis (P.R.R.-controlled) leased the Columbus, Chicago & Indiana Central in 1869. The P. C. & St. L. leased the Little Miami Railroad in 1870, providing a connection into Cincinnati. Control of the Northern Central line into Baltimore was acquired in 1870. In 1870, also, the railroad company organized the Pennsylvania Company to which it transferred its holdings in western connecting lines. The Cleveland & Pittsburgh was leased in 1871.

The properties of the United New Jersey Railroad & Canal Company were leased in 1871 and during the regime of President J. E. Thompson the railroad reached practically all the large cities excepting Norfolk and Buffalo, which it serves today; mileage, of course, has expanded greatly since then.

President J. Edgar Thompson died in 1874—his career with the railroad having witnessed its growth from nothing to 1,574 route-miles (not including western lines or those not P.R.R.-operated); with gross revenues of almost $40 million. The new president was Thomas Alexander Scott, whose military career during the Civil War has been noted heretofore in this report. Colonel Scott, like his predecessor, was by birth a Pennsylvanian. He did not have extensive formal education, and began his business career at the age of 16. At the age of 26 (in 1850) he entered the employ of the Pennsylvania as a station agent and by 1860 he was a vice-president. During his presidency, the physical and corporate development of the property continued along the lines established by his predecessor; and, in addition, he took a leading part in the efforts made in those days to curb the excesses which developed in competitive rate-making, and which ultimately led to enactment by Congress of the Interstate Commerce Act.

Incidentally, in passing, it may be noted that the Pullman Company began its operation of sleeping and parlor cars on the Pennsylvania in 1870. A concern known as T. T. Woodruff & Co. had supplied this service prior to 1858. Thereafter, the railroad contracted with the Central Transportation Company for the service. The Central Company was taken over by Pullman in 1870, and the P.R.R. continued the service with the new proprietor.

In 1876 the Pennsylvania established through passenger service between points on its line and New England, by the operation of a car ferry from the P.R.R. terminal at Jersey City, through the East river to the New Haven's Harlem river terminal.

In 1880 President Scott retired because of ill-health (he died in 1881) and George Brooke Roberts succeeded him. Born in Pennsylvania, Mr. Roberts was educated at Rensselaer Institute and began his railroad career—as so many Pennsylvania officers have since done—as a rodman. After extensive experience in the engineering department he became assistant to president and then vice-president. Control of the Philadelphia, Wilmington & Baltimore Railroad was acquired in 1881, and its trains to Philadelphia were diverted to the P.R.R.'s new Broad Street Station.

Upon the death of President Roberts in 1897, Frank Thompson was chosen to succeed him. Born at Chambersburg, Pa., Mr. Thompson became an apprentice at Altoona Shops at the age of 17 (in 1858) and later became superintendent of motive power, from which position he was advanced to that of general manager and, later, to vice-president. Barely two years later, in 1899, Mr. Thompson died and was succeeded by Mr. Cassatt. A native of Pittsburgh, Mr. Cassatt was educated in Europe and at Rensselaer Institute. He entered P.R.R. service as a rodman, became a superintendent, and then went to the mechanical department as superintendent of motive power. He was later general manager and vice-president, but retired from his vice-presidency in 1882, while retaining his directorship during the period intervening until he was chosen as president.

Left—The "T-1," for high speed passenger service. Right—The Pennsylvania's direct-drive, turbine locomotive

His regime initiated the company's period of intensive development. Far-reaching improvements were begun in the New York area, involving the tunneling of the North and East rivers, the construction of the modern passenger terminal in New York, and the construction of the Hell Gate bridge route to provide a through connection with the New Haven, together with the necessary electrification. Control of the Long Island Railroad was acquired in 1900. Important low-grade freight lines and extension of multiple tracking also characterized the regime of President Cassatt. He died in 1906 and was succeeded by Mr. McCrea.

President McCrea was another of the Pennsylvania executives who began his career as a rodman. A Philadelphian by birth, he received an education in civil engineering at Pennsylvania Polytechnic College and entered railroad work in 1865. Progressing through various engineering department positions, he entered the operating department and was vice-president of the "Lines West" when he assumed the presidency. Mr. McCrea resigned in 1913 and died shortly thereafter, being succeeded as head of the company by Samuel Rea, another Pennsylvanian who had begun his railroad career as a rodman and advanced through the engineering department. As vice-president he was actively in charge of the improvements in the New York area.

In addition to the New York project, the Pennsylvania was a partner in passenger terminal improvements at Washington (completed in 1907) and initiated the Chicago Union Station project (in company with other railroads) in 1913. The New York Connecting Railroad (Hell Gate bridge route) was opened in 1917, the Pennsylvania Station in New York having been put into service seven years earlier. Mr. Rea was the Pennsylvania's chief executive during World War I, when the railroads were operated by the government. During that conflict, as in the Civil War, a P.R.R. vice-president became the leading figure in military railway transportation. This vice-president was W. W. Atterbury, who, as director general of transportation for the army in Europe, attained the rank of brigadier general. Born in Indiana, General Atterbury was a graduate of Yale and he began his career on the Pennsylvania as a mechanical department apprentice. He rose through that department to the position of general superintendent of motive power and was then transferred to the operating department which he headed as vice-president. A leader in locomotive standardization, he succeeded Mr. Rea as president of the railroad in 1925. In his incumbency the company's extensive improvements at Newark, N. J., and Philadelphia, and electrification of main lines from New York westward to Harrisburg and southward to Washington were undertaken and were pressed forward despite the serious depression of the 'thirties.

General Atterbury believed that, in the public interest, the railroads should be permitted to engage in other types of transportation besides that by rail and during his regime the railroad entered largely into highway transportation, co-ordinated with the railroad. It pioneered also in the establishment of coordinated rail and air service. Expense control, heavier rail and permanent bridge structures have been P. R. R. policy carried forward under General Atterbury and pursued with vigor ever since.

When General Atterbury retired in 1935, he was succeeded by Mr. Clement, a Pennsylvanian by birth and a graduate in civil engineering from Trinity College. He began his career with the Pennsylvania as a rodman and rose through the engineering and operating departments to the operating vice-presidency, which was his position when he succeeded President Atterbury. To him fell the task of completing the extensive terminal, electrification and other improvements begun by his predecessor; plus the task of directing the operations of this highly strategic property through the war period of its maximum national service. In the first year of Mr. Clement's presidency, 1935, the Pennsylvania's traffic amounted to 29.9 billion revenue ton-miles and 3.5 billion passenger-miles. In both 1943 and 1944 the company's ton-mileage reached 71.4 billion; and in 1944 passenger-miles mounted to 15.1 billion. The railroad's activity in improving its passenger and freight service prior to World War II, and recent evidence of the great preparations in equipment which it is making for the resumption of this progress, indicate that the record of the present administration is as yet far from complete.

In its first sixteen months of operation 1849-50, the Pennsylvania had gross revenues totaling $339,452. Gross revenue in 1945 was $979,444,033—and it was greater than that in the two preceding years; over $1 billion in 1944.

Since stockholders first put their money into the railroad in 1847, they have been paid at least some return on their investment in every single year. Aggregate payments to stockholders in the period of close to a century have amounted to just a little less than $1,298 million. Bondholders in the same period have received somewhat more than a billion dollars.

Employees, however, in the same period of time have been paid over $10 billion in wages—which gives a general idea of the relative interest of "capital" to that of labor in the successful functioning of a modern railroad enterprise.

Locomotives for Today and Tomorrow

An outline of what may be expected of reciprocating steam, geared-steam-turbine, steam-turbine-electric, Diesel-electric, gas-turbine and electric locomotives

By CHARLES KERR, Jr.

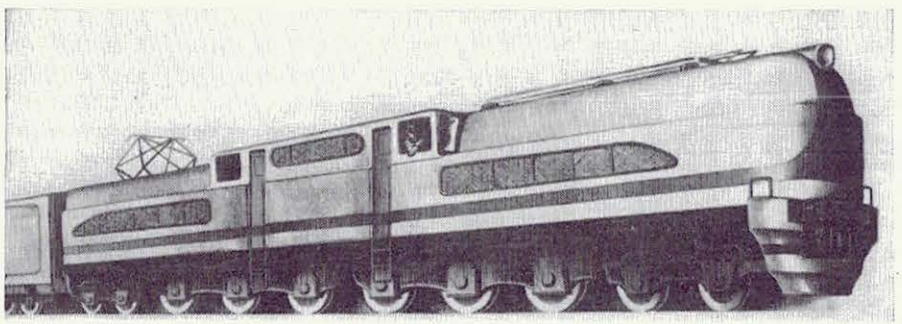
Consulting Transportation Engineer, Westinghouse Electric Corporation

TODAY the railroads are generally operated by three classes of motive power—reciprocating steam, Diesel-electric and electric. But new types are rapidly coming into use. In 1944, the geared steam turbine made its appearance and promises to open new fields for steam power. Soon the first coal-burning steam-turbine-electric will enter service. And, in the not too distant future, the gas-turbine locomotive is certain to appear. With the diversity of operating conditions encountered by the American railroads, there are places where each of these types can be put to good use, and none should be "sold short."

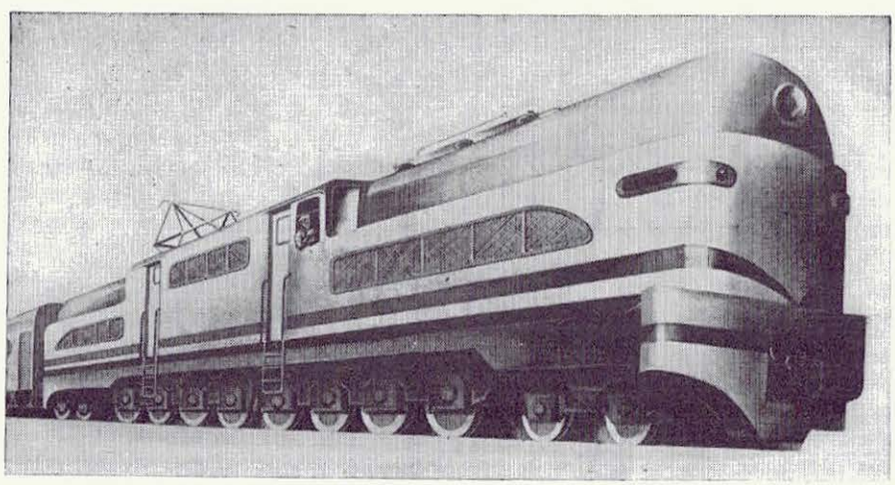
This article is an abstract of a paper presented before the New York Railroad Club in New York, N. Y., March 21, 1946.

Electrification

Unfortunately, because of a rather high first cost, electrification has been confined in its application to lines of heavy traffic density, or to the solution of operating problems which, by other means, could not be overcome. However, in spite of this handicap, certain trends are appearing which are likely to produce an extended use.



An electric locomotive with a continuous rating of 7,500 hp.



A 10,000 hp. (continuous rating) electric locomotive with a 2-D+D-2 wheel arrangement

First—the railroads must continually improve their service to prevent their competitors obtaining a large share of the nation's traffic. To meet this competition and keep the traffic on the rails where it belongs, passenger trains will eventually operate at 100 m. p. h. or more, and freight trains at 70 m. p. h. or more. To maintain such speeds continuously, locomotive capacities will exceed those generally in use today. Operation of heavy traffic under these conditions enhances the economies to be derived from electrification and broadens its scope of economical application.

Second—the direct operating expenses of an electrified railroad are the absolute minimum. With inflation facing us, this feature of electrified operation will become increasingly attractive.

Third—with the continued increase in efficiency of centralized power generation, the trend of electric-power costs has been downward while all other fuels are steadily increasing in price. Electricity is produced by burning coal or by water power, our most assured long-range sources of energy.

If the first cost is to be reduced, there must be greater standardization. In addition, it should be made easier for a railroad to electrify. Any railroad should be able to purchase an electrification, completely engineered and installed, for a definite price, accompanied by a long-term power contract and a simple plan of financing. Electrification should be just as easy to buy as any other type of motive power.

Typical Examples of Tomorrow

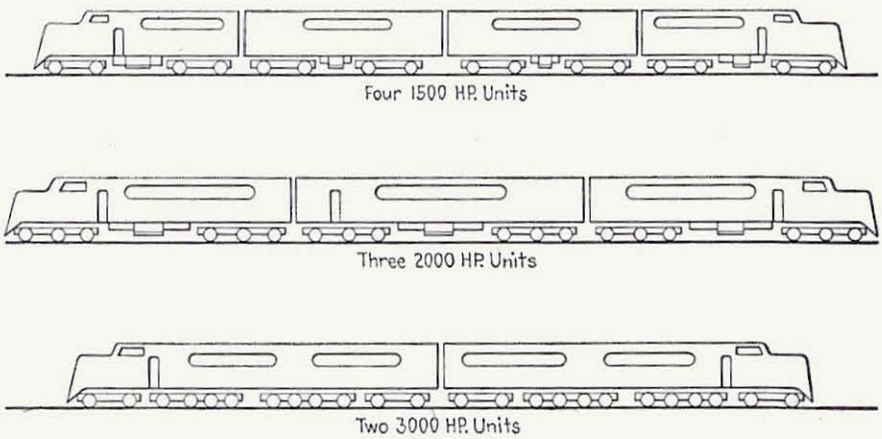
To show what may be accomplished by electrification, I would like to present two locomotives which are typical of the electric locomotive of tomorrow.

The first of these locomotives has the conventional 4-6-6-4 wheel arrangement. This cab and general wheel arrangement make the best operating unit known to the locomotive art. Despite its familiar outward appearance, it nevertheless differs inwardly from its predecessors. With six pairs of drivers, it is physi-

cally no larger than present designs and only slightly heavier. But it carries 50 per cent more capacity, or 7,500 continuous horsepower and 13,000 maximum horsepower.

The second design is similar to the first one shown, except it has eight driving axles. Without exceeding generally acceptable dimensions and weights, 10,000 continuous horsepower can be developed, or 17,000 maximum horsepower.

Both locomotives can meet practically any desired combination of speed and axle loading. They can be built to operate on either d.c. or a.c. systems and production could be started on short notice. They have sufficient power to handle heavy passenger trains, 15 to 20 cars, at speeds of 100 to 125 m. p. h., over long stretches of varying profiles, or to handle 100- to 125-car freight trains at 70 to 75 m. p. h. under similar conditions. They will meet any foreseeable future requirement.



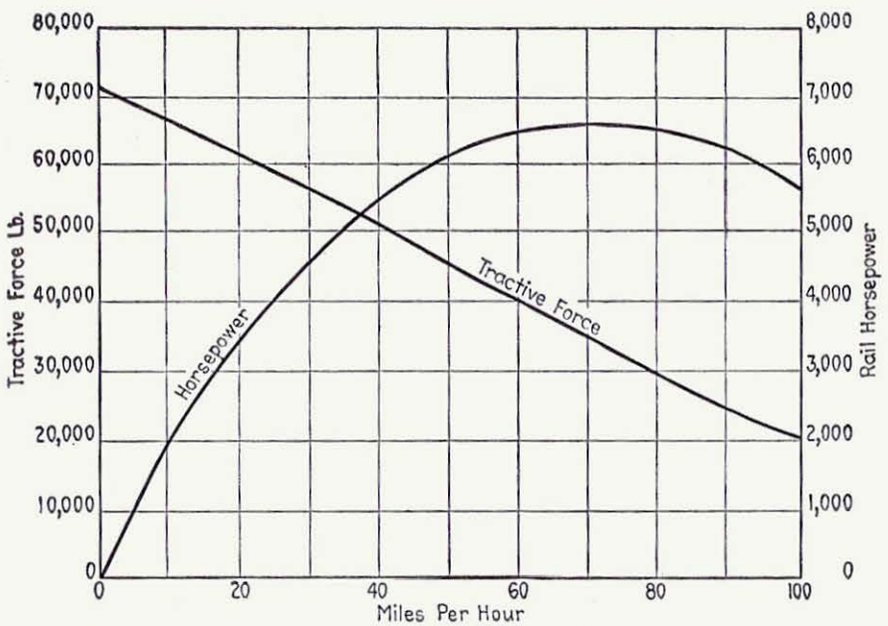
Diesel locomotives for high-speed passenger service

The Diesel Electric

The Diesel-electric has characteristics which make it especially well suited to switching, transfer and branch-line service, where, as a general rule, units of 2,000 hp. or less are required. Road service demands big locomotives. The largest Diesel road locomotive develops 6,000 engine horsepower. When the losses between engine and rail are deducted, the net horsepower available is approximately 5,000. As now constructed, these locomotives comprise two, three, or four units totaling approximately 200 ft. in length, and weigh between 185 and 230 lb. per rail horsepower.

Of the various single units now manufactured, the largest delivers about 2,500 hp. at the rail, or 3,000 engine horsepower. By comparison, in the same overall length, a 10,000-hp. electric locomotive can be built—just four times the effective continuous capacity of the Diesel. Furthermore, this electric has overload capacity and the Diesel does not. Steam power is approaching 8,000 hp. or almost three times that of the Diesel. And there will apparently be demands for still larger power.

To appraise completely the Diesel road locomotive, it is interesting to examine the requirements of present designs when handling large trains at various speeds. At 80 m. p. h., two conventional cabs are sufficient to handle modern 17-car trains weighing 1,150 tons and at 100 m. p. h., three cabs are ample. At these speeds, the motive power is within present standard practices. However, should passenger speeds exceed 100 m. p. h., the Diesel locomotive, as it exists today, might rapidly become a monstrosity. For at 125 m. p. h., the locomotive is 370 ft. long and weighs 80 per cent of the train it hauls. About one-half of the power developed by the locomotive is wasted in pulling itself. These power requirements provide no margin for adverse grades, or for rapid acceleration to these speeds. The requirements have not been exaggerated.



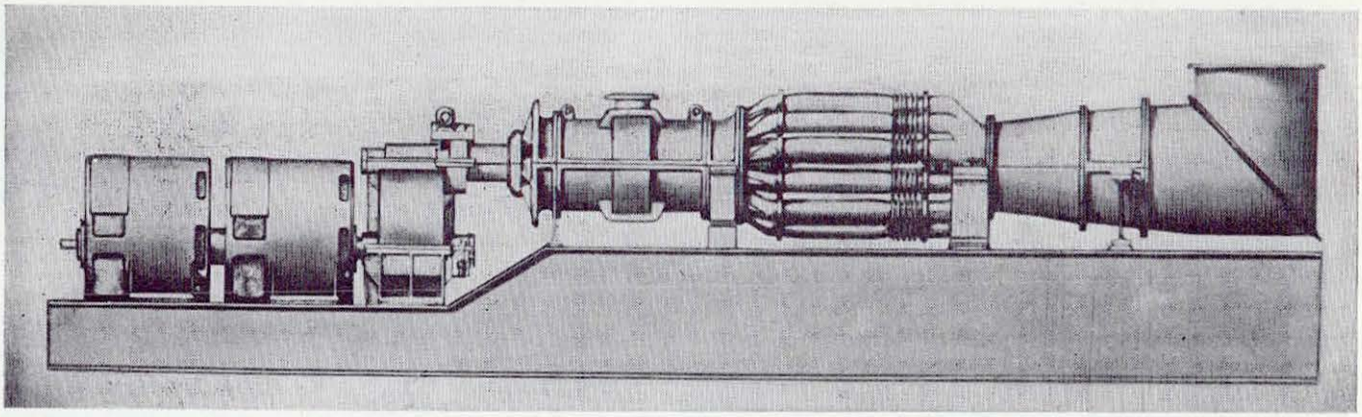
Performance characteristics of the Pennsylvania Class S-2 geared turbine locomotive

Purchasers Demanding Speed

In high-speed freight service, to operate a 5,000-ton train at 70 m. p. h. requires almost three times as much locomotive capacity as that required at 40 m. p. h. The locomotive becomes a fair sized train in itself. Many requests which we are now receiving for new locomotives demand provision for future operation at such speeds, indicating that railroad managements are anticipating them.

The limitations of the Diesel locomotive are often accredited to the electric transmission, and by the same token, it is claimed that everything would be all right if it could be avoided. Actually, the Diesel engine has very poor characteristics for traction purposes. Electric transmission has provided a very flexible means for delivering power to the rail, and has permitted the prime mover to be designed with the greatest freedom from many burdensome restrictions.

The long-range status of the Diesel locomotive would be bettered if greater capacity could be built into a single unit. Physically, the largest single-unit locomotive which can operate within the



A 2,000-hp. gas turbine with geared drive and electric generators—The unit is 26 ft. 3 in. long, 3½ ft. wide and 6 ft. high

clearance restrictions of most roads is about 92 ft. long, employing twelve carrying axles, any number of which can be made into driving axles.

With motors that are now in large-scale production, only eight driving axles are needed to give ample starting and continuous tractive force for most passenger service. The largest engine capacity yet placed in this size cab is 3,000 hp. Electrical equipment now available can utilize 6,000 hp., but the Diesel engines, to produce 6,000 hp. in this space, are yet to be produced.

With this same running gear, and the same motors, a freight locomotive could be built with all 12 axles motorized, providing 180,000 lb. starting tractive force and 125,000 lb. continuous tractive force. Actually, these 12 motors could absorb 9,000 Diesel-engine horsepower if the Diesel engines were available to deliver this amount of power.

We believe that eventually the most serious limitation of the present Diesel locomotive will prove to be its relatively poor weight and space efficiency. We want to see these improved, for then the future of the Diesel will be even brighter, with its field of application ranging, without undue restrictions, from the smaller sizes suitable to switching service to the largest main-line requirements of the future.

Steam Locomotives

Today, steam is encountering the toughest competition of its long and useful existence, but you can rest assured the old "iron horse" is far from dead. The steam locomotive is rapidly becoming three locomotives—reciprocating, geared-turbine and turbine electric. The modern reciprocating locomotive is the product of 125 years of constant development. New developments are usually confined to a perfection of details which, in the aggregate, result in extensive progress.

The so-called "duplex" locomotive is probably the answer to reciprocating drives for very large locomotives. Where increased power must be produced, the trend in all reciprocating-engine practice, including internal-combustion engines, is towards higher speeds of reciprocating parts, lighter-weight parts and increased number of cylinders.

In late 1944, the Pennsylvania took delivery of the first American geared-turbine locomotive, known as its Class S-2. This development represents one of the most important changes in the power principle of the steam locomotive in over 100 years, and gives promise of a great future in the field of train transportation. Approximately 50,000 miles of revenue service have been accumulated. Naturally, some troubles have been experienced, but they have been less serious than any of us had anticipated.

Geared Turbine

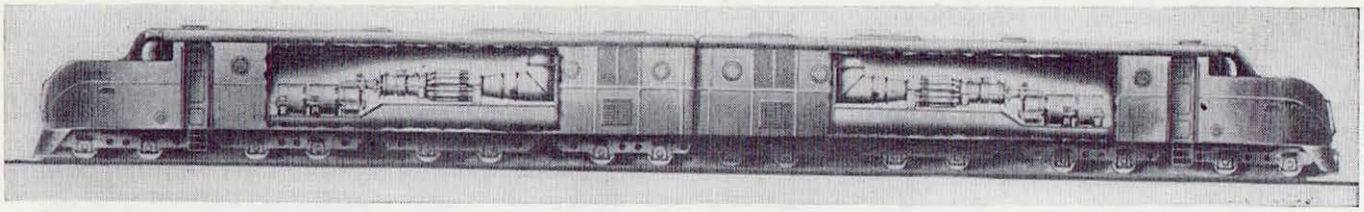
The propulsion equipment on the Pennsylvania turbine locomotive was designed to follow proven marine and rail practices to the greatest possible extent. The weights of the actual turbine and drive are quite interesting. The main turbine, producing 6,900 shaft horsepower, weighs 5,000 lb., or less than ¾ lb. per horsepower. The entire propulsion apparatus, including auxiliaries and control, runs less than 6 lb. per horsepower. To our knowledge, these are the lowest weights ever attained in propulsion equipment for traction purposes.

One of our big surprises when the turbine locomotive was first announced was the discovery that many people did not appreciate that a turbine could produce sufficient starting tractive force for train operation. Actually, the characteristic performance of a geared turbine is well adapted to traction purposes. The Pennsylvania locomotive was built with gearing selected for maximum operating speeds of 100 m. p. h. with a 10 per cent margin for overspeeding. With this selection of gearing, it is a high-speed passenger or freight locomotive. Where the predominating operating speeds are higher or lower, a suitable selection of gearing can be made.

One limitation of the steam locomotive has been the necessity for using side rods and large-diameter driving wheels. These have limited the selection of wheel arrangement, and most important of all, the large wheels have reduced the space available for the boiler which, after all, is the ultimate limit of capacity. Work is progressing on a geared-turbine drive to remove these obstacles to the steam locomotive. This drive will permit 48-in. drivers to be used, irrespective of the maximum speed desired, and will substitute a longitudinal shaft and bevel gearing to take the place of the side rods. A reverse gear may be incorporated in the high-speed gear reduction to eliminate the reverse turbine. Furthermore, with the proposed type of reverse gear, a different gear ratio can be provided, if desired, in the two directions of operation.

A geared-turbine drive of this character would permit radically new types of steam power to be built. For example, there is a design developed by the Pennsylvania Railroad, employing the geared-turbine drive which we have described, in which the truck-type of running gear becomes available in steam practice, introducing a type of locomotive which has proven so eminently satisfactory in electric and Diesel-electric practice. Thus, excellent tracking characteristics are assured. In addition, restrictions are removed to the firebox, grate and ash pan. This locomotive, developing 9,000 hp., would be driven by two turbines, one on each truck.

Another application might be to the conventional 4-8-4 type, in which the wheels are small and the rigid wheel base is shortened. The turbine is located under the smoke box, simplifying the steam piping. The short rigid wheel base provides space for a larger grate and fire box, increasing the efficiency of



A proposed type of two-unit locomotive which might use four 2,000-hp. gas turbines for freight service

burning fuel. The small wheels afford space for a larger-diameter boiler, reducing the draft loss. These factors indicate a locomotive with better operating characteristics and better overall efficiency.

A third application of this drive is an attempt to provide the ideal universal freight and passenger locomotive. With small wheels, six driving axles can be introduced into the same overall wheel base now taken by fewer axles. The tender has also been redesigned to be either pushed or pulled, employing an arrangement of wheels to permit this kind of operation. The reverse gear provides a different gear ratio in the two directions of motion. Running with the locomotive forward, the locomotive would be a 120 m. p. h. passenger unit; with the tender forward, a 70 m. p. h. freight unit, providing improved characteristics in the speed range common to freight service. With six driving axles, sufficient boiler capacity can be carried to develop 8,000 to 9,000 hp. without excessive wheel loads.

Gear Shift a Possibility

Before leaving the geared-turbine drive, I would like to introduce one other future possibility—a gear shift. Designs of a gear shift have been made, and the equipment for a large locomotive is about the size of a bushel basket. The gear shift makes possible a locomotive with a maximum tractive force of 140,000 lb., capable of developing over 7,500 hp. at all speeds from 20 to 100 m. p. h., and with essentially a constant steam rate over this whole speed range. A single locomotive becomes suitable for any type of rail service, drag freight, high-speed freight, or passenger.

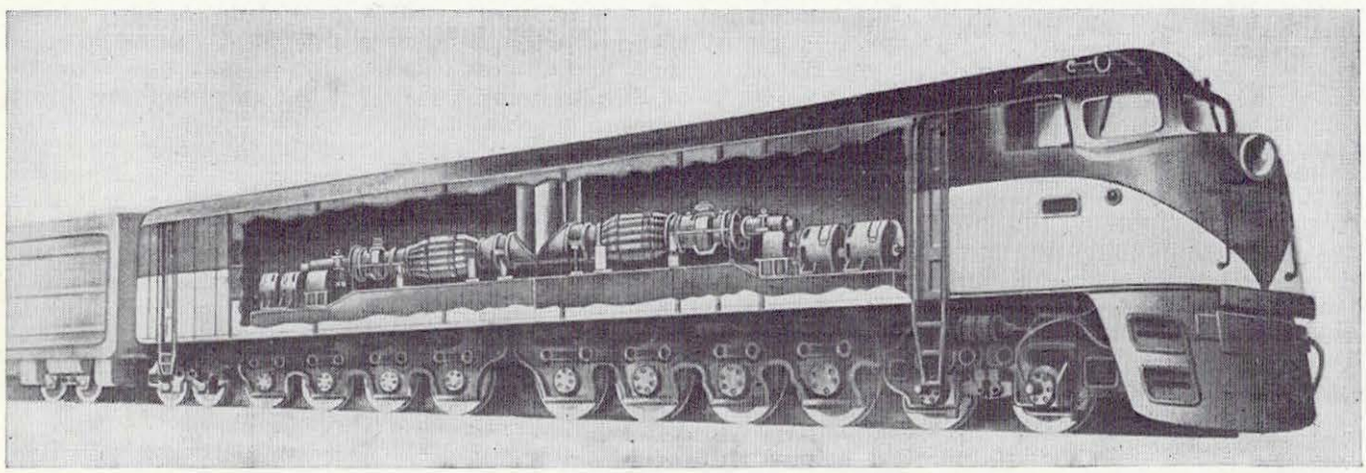
The exact line of demarcation where electrical or mechanical drive for a turbine locomotive becomes the preferred transmission has not been fully determined. Electric transmissions have a background of millions of miles of service, and new installations and new materials are continually producing equipments with better space and weight characteristics. They also provide certain flexibility in the overall arrangement of the locomotive that a mechanical drive cannot obtain, for electric transmission permits the prime mover to be completely disassociated from the driving wheels.

In a few months, the first coal burning, turbine-electric locomotives will enter service on the Chesapeake & Ohio, introducing another new type of steam motive power. While these locomotives will be equipped with conventional boilers, they will be quite novel in many respects. A cab-mounted 6,000-hp., 6,000-r. p. m. turbine will drive two direct-current generators through single-reduction gearing. Traction power will be derived from eight axle-hung motors. The locomotive speed will be controlled by a variation of turbine speed and generator excitation, the combination which produces the best overall efficiency.

These locomotives are being built for passenger service between Washington and Cincinnati, a territory where long severe grades are encountered in some portions, and where fast speeds are demanded in others. This class of operation is ideal for electric transmission.

The application of electric transmissions to a turbine locomotive involve certain considerations that are different from those in Diesel practice. The turbine operates at 6 to 20 times Diesel-engine speeds, has high standstill torque, will not stall if overloaded, and within reasonable limits, its horsepower is constant over a wide speed range. With these characteristics, alternating-current types of electrical transmission offer possibilities worth consideration; and this the a.c. systems are receiving. The first turbine-electric locomotives will use the d.c. drive, as it is a proven device. Further development work may make the a.c. types competitive in weight, cost and performance.

The steam locomotive needs a better boiler. The best modern steam locomotives with fire-tube boilers operate at approximately 300 lb. pressure, 750 deg. F. total steam temperature and 15 lb. exhaust pressure at full load. When operated at capacity, boiler efficiencies are about 50 per cent. Central station and marine apparatus operate under con-



Gas turbines might be used in the manner shown to produce an 8,000-hp. passenger locomotive

siderably more favorable steam conditions. Were the steam locomotive to operate under equally favorable steam conditions, it would be a motive power unit with low fuel expense.

The advent of the turbine drive will accelerate the development of better boilers, for it provides a means fully to utilize high pressures, high temperatures and low exhaust pressures. The steam conditions for the ideal non-condensing 6,000-hp. turbine locomotive are 600 to 800 lb. pressure, 900 to 925 deg. F. total steam temperature and 0 to 5 lb. exhaust pressure. To produce such low exhaust pressures may require auxiliary means for drafting the boiler.

Compared with the best modern practice, the steam consumption per horsepower hour would be reduced about 30 per cent. The fuel consumption would be reduced about 27 per cent, assuming the same boiler efficiency. Better steam conditions pay handsome dividends.

The burning of pulverized coal has many advantages and considerable work is under way to find means of using it in locomotive boilers. This is not, however, a simple problem. But sooner or later, it will be solved, for the burning of pulverized coal, both in a boiler and eventually in the gas turbine, is of such importance that the time and money necessary for a solution to the problem will be forthcoming to perfect a method.

While steam power is meeting the most severe competition that it has ever known, the steam locomotive enjoys five attributes that will continue to be a thorn in the side of its competitors:

1—Low first cost. With production in equal volume, this advantage will also be enjoyed by the turbine locomotive.

2—Modern steam power, with modern maintenance methods, is making enviable availability records with exceedingly low repair costs.

3—As a means of packing power into a single locomotive unit, steam power, reciprocating or turbine, leads the parade except for electrification.

4—The steam locomotive, reciprocating or turbine, can burn either coal or oil as economic conditions dictate.

5—Better steam locomotives than we have ever known before are on their way.

The Gas-Turbine Locomotive

The gas turbine operates on hot air, and if all the "hot air" expended in the public press about the gas turbine could be collected, the railroads would have a cost-free fuel for all time. The gas turbine has great possibilities, but it is not necessarily a cure-all.

The fundamental theory of the gas turbine was well developed in the late 1800's. You may well ask, "Why has it not been used before?" The answer is a simple one—Materials have not been available to withstand the required temperatures. At 800 deg. F., the gas turbine will just turn itself over. Useful work is performed only to the degree that temperatures above 800 deg. F. are employed.

There is a 2,000-hp. gas-turbine generator unit, now on test, suitable for locomotive use. The entire unit is 26 ft. 3 in. long, 3½ ft. wide and 6 ft. high. Two units might be placed side by side in a locomotive with a center aisle, permitting 4,000 hp. of prime-mover capacity in approximately 26 ft. of cab length. This unit is designed to burn Bunker C oil. It consists of a compressor, combustor, turbine, gear unit and generators. Its overall weight is 39,000 lb. To my knowledge, this is the first American gas turbine designed and built with dimensions suitable for application to locomotives of large capacity. It is now on the test floor, getting the "bugs" worked out of it.

In the gas turbine, the products of combustion are used directly in the turbine which operates at temperatures above 1,300 deg. F. Complete fuel combustion must be obtained in the burners, for a carryover of liquid or solid matter will erode the blades at these high temperatures. Aviation fuels cannot be used on locomotives, either from the cost or safety viewpoint. The first railroad gas turbines are likely to burn some grade of fuel oil such as Bunker C.

The second big problem is blading material to withstand the high temperatures. Material is affected both by temperature and life, for at these high temperatures the material has a tendency to "creep." If the gas-turbine locomotive is to be successful, the life of the blading must be measured in years, not in hours.

The gas turbine, when used to drive its own compressor, has no starting torque. It must be started by auxiliary means like the Diesel. This characteristic compels the use of electric transmission, or two turbines, one for traction. The first gas-turbine locomotives will unquestionably use the d.c. system of transmission because it is a proven device and plenty of headaches exist without looking for additional ones. Eventually some form of a.c. drive may prove practical with the gas turbine, especially the rectifier conversion system.

Steam turbines have been perfected to the point where they operate for many years without repairs. Often they run for years without being shut down. Eventually, the gas turbine should approach this same service life, producing a locomotive prime mover with excellent availability and low maintenance expense.

Given a 2,000-hp. gas turbine, it is possible to design a gas-turbine locomotive for high speed, heavy duty passenger service. In a single cab, weighing 325 tons, and employing a 4-8-8-4 wheel arrangement, four 2,000-hp. gas-turbine-generator sets can be installed. These sets, placed side by side, consume less than 60 per cent of the total cab length, leaving over 40 per cent for other necessary apparatus. Eight of the driving axles would be equipped with motors, providing 100,000 lb. starting tractive force when the motors are geared for a maximum speed of 120 m. p. h. The weight per horsepower developed would be considerably less than that of present self-propelled locomotives.

An 8,000-hp. gas-turbine locomotive for heavy-duty freight service, with 16 drivng axles, could be built in two units. It would weigh approximately 450 tons, with all weight on the driving axles. The starting tractive force would be 225,000 lb. and the continuous tractive force 160,000 lb. at 15 m. p. h., or 100,000 lb. at 24 m. p. h. The locomotive maximum speed would be 70 m. p. h.

When coal can be used as a fuel, the gas turbine will be a serious competitor to all other types of power. The burning of coal satisfactorily in a gas turbine is no easy problem, and I hesitate to predict when it will be solved. Many people and many organizations are working hard to surmount the obstacles that must be overcome, and it may be with us sooner than some expect.

Nature of Development Work

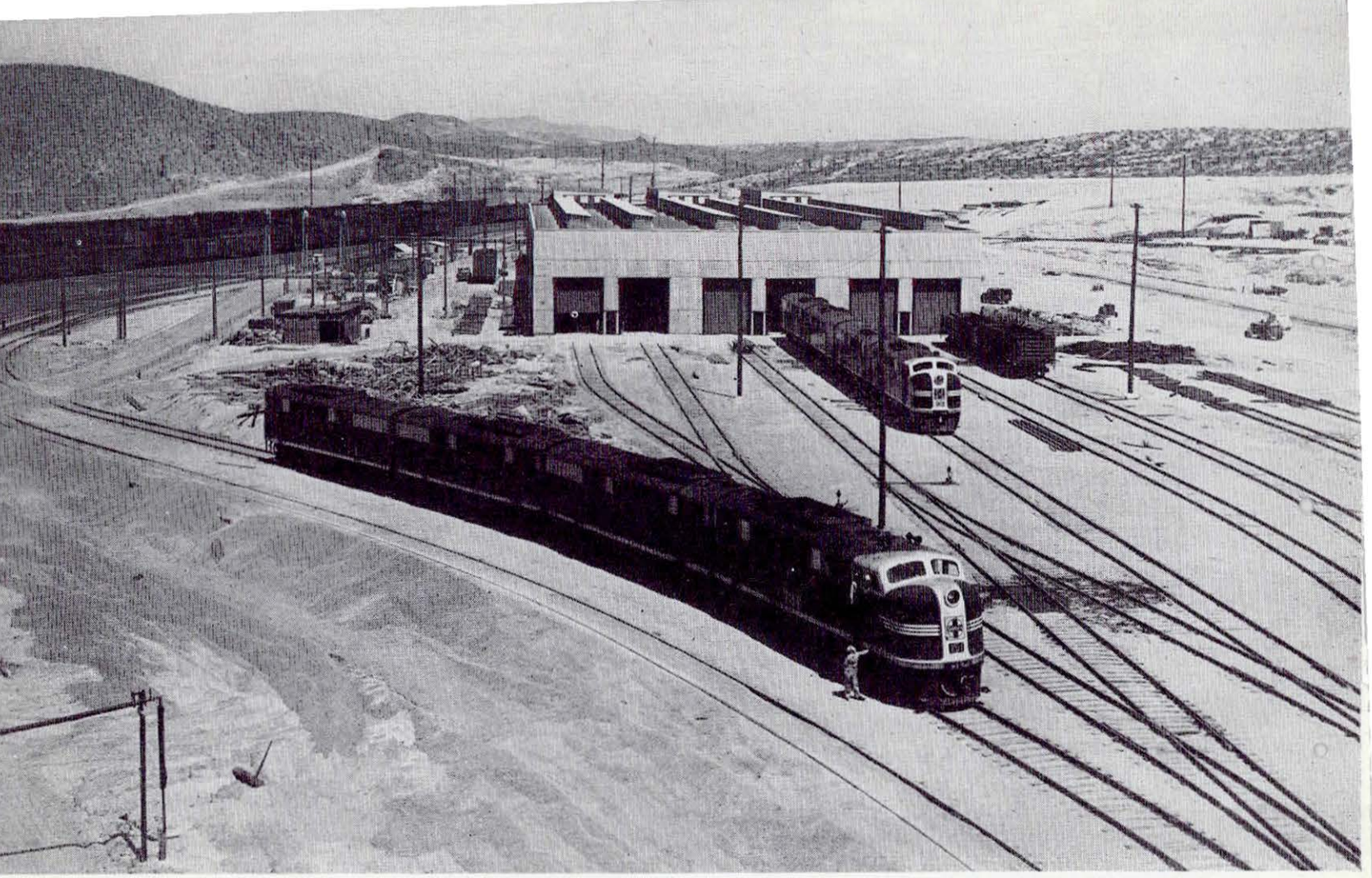
Development work in burning coal is following along two major lines:

1—To pulverize the coal to such fineness that complete combustion can be secured in the burners with no damaging solid material carried over into the turbine blade path. This system may require, for its successful use, preparing coal in stationary plants prior to placing it on the locomotive.

2—To pulverize the coal to accepted central station practice and then separate any remaining solid matter after burning, by means of centrifugal cleaners, before the products of combustion enter the turbine.

So that you will not be misled, I would like to add one word of caution. The gas-turbine locomotive is not going to be cheap. The prime mover is constructed from about the highest-price materials known augmented by precision manufacture of all parts. It will definitely be more expensive than steam power, and probably in the order of Diesel power.

There is now, and in the future, a definite place on the American railroads for all types of motive power. We, of the Westinghouse Company, so strongly believe this to be true that we are lending our efforts without discrimination, and to the limit of our facilities, to the perfection of all types — electric, gas-turbine, steam and Diesel.



Looking east toward the new Diesel shop building at Barstow. The elevated sand tanks at the fueling platform may be seen in the background at the left

Diesel Shops on Santa Fe Coast Lines

Extensive facilities provided for repairing and servicing freight locomotives operating primarily between Winslow, Ariz., and Barstow, Cal., 459 miles

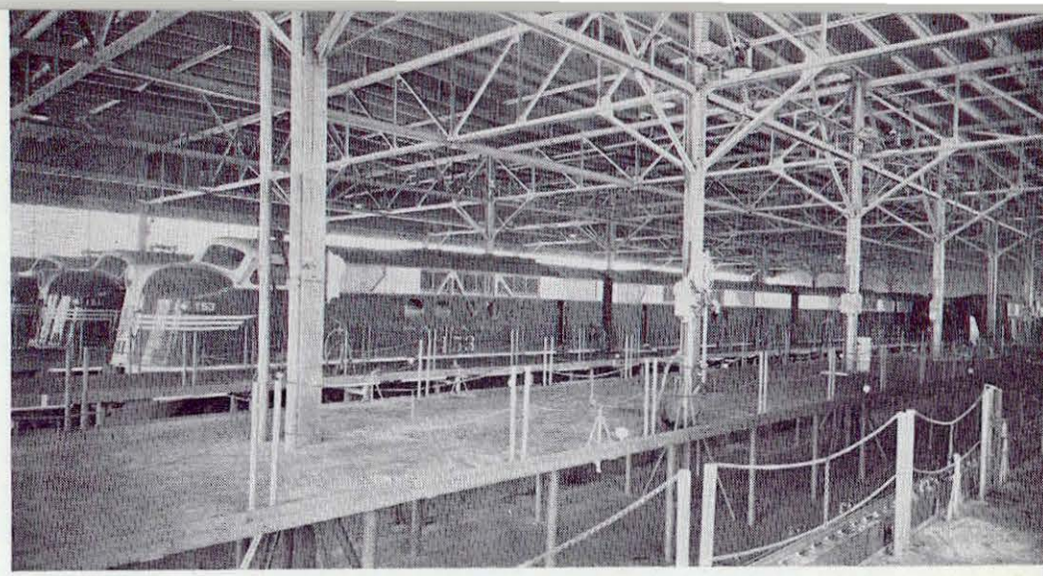
Part II

Part I of this article, published in last week's issue, reviewed the considerations that led the Santa Fe to place a large fleet of Diesel-electric freight locomotives in service on its Coast Lines between Winslow, Ariz., and Barstow, Cal., outlined briefly the various facilities that have been installed for servicing and repairing these locomotives, and described in detail the work done at Winslow and at San Bernardino, Cal. Part II describes the new maintenance building and servicing facilities that have been constructed at Barstow.

THE Diesel servicing and repair facilities that have been built at Barstow include a maintenance and shop building, with an adjoining inspection pit and transfer table for changing out trucks and wheels; a double-track fueling platform with truck-washing equipment and an adjacent sanding plant; and various auxiliary installations, including facilities for handling and storing fuel and lubricating oil, and a water-evaporating plant for producing distilled cooling water. To give access to these facilities considerable track work was involved, including the construction of new tracks and the relocation of existing trackage. The installation at Barstow is in every respect an outstanding example of up-to-date practice in the design and construction of such facilities.

The Diesel maintenance shop is located on the south side of the main tracks and east of the existing enginehouse. The design of the building is based on a stub-end layout with the tracks entering it from the west end. The fueling platform is located a short distance northeast of the shop building, with two tracks extending from the platform to a connection with the maintenance-shop leads west of the building. Other trackage is provided to permit locomotives leaving the shop to proceed eastward or westward, although most of them move

Note: All photographs courtesy Atchison, Topeka & Santa Fe.



Interior of the service section of the Barstow shop showing the steel platforms with their movable and adjustable safety chains

to the east end of the yard for attachment to eastbound trains.

The Maintenance Shop

The shop building is 325 ft. long and 138 ft. wide, except at the east end, where a projection on the south side increases the width to 184 ft. for a distance of 100 ft. Entering the building from the west end are six tracks which, with the platforms and floor space serving them, occupy the full width of the building for a distance of 250 ft. The remainder of the structure, consisting of a portion at the extreme easterly end having dimensions of 75 ft. by 184 ft., is devoted to office, shop and storage space, and facilities for employees. This latter portion, which is underlaid throughout by a basement, is of one-story construction, except that there is a mezzanine area along the north side.

The maintenance building is of noncombustible construction throughout, consisting essentially of concrete footings supporting H-section steel columns in the side walls and at intermediate points, which carry transverse structural-steel roof trusses, with parallel chords, which are placed on 25-ft. centers. The side walls are covered with corrugated asbestos-cement siding topped by sheet-metal copings. Ample daylight illumination is supplied by a practically continuous band of steel sash in each side wall and in the wall at the east end. At the west end there is a locomotive door opening at the location of each track, all of which are fitted with roll-type steel railroad doors.

The roof consists of 2-in. gypsum slabs covered with composition roofing, except that over each track there is a continuous monitor, roofed with corrugated asbestos-cement sheets. The side and end walls of each of the monitors consist of continuous louvers, also made from corrugated asbestos-cement sheets. At the east end of the building the roof contains three large clerestories, the side walls and ends of which have continuous bands of steel sash.

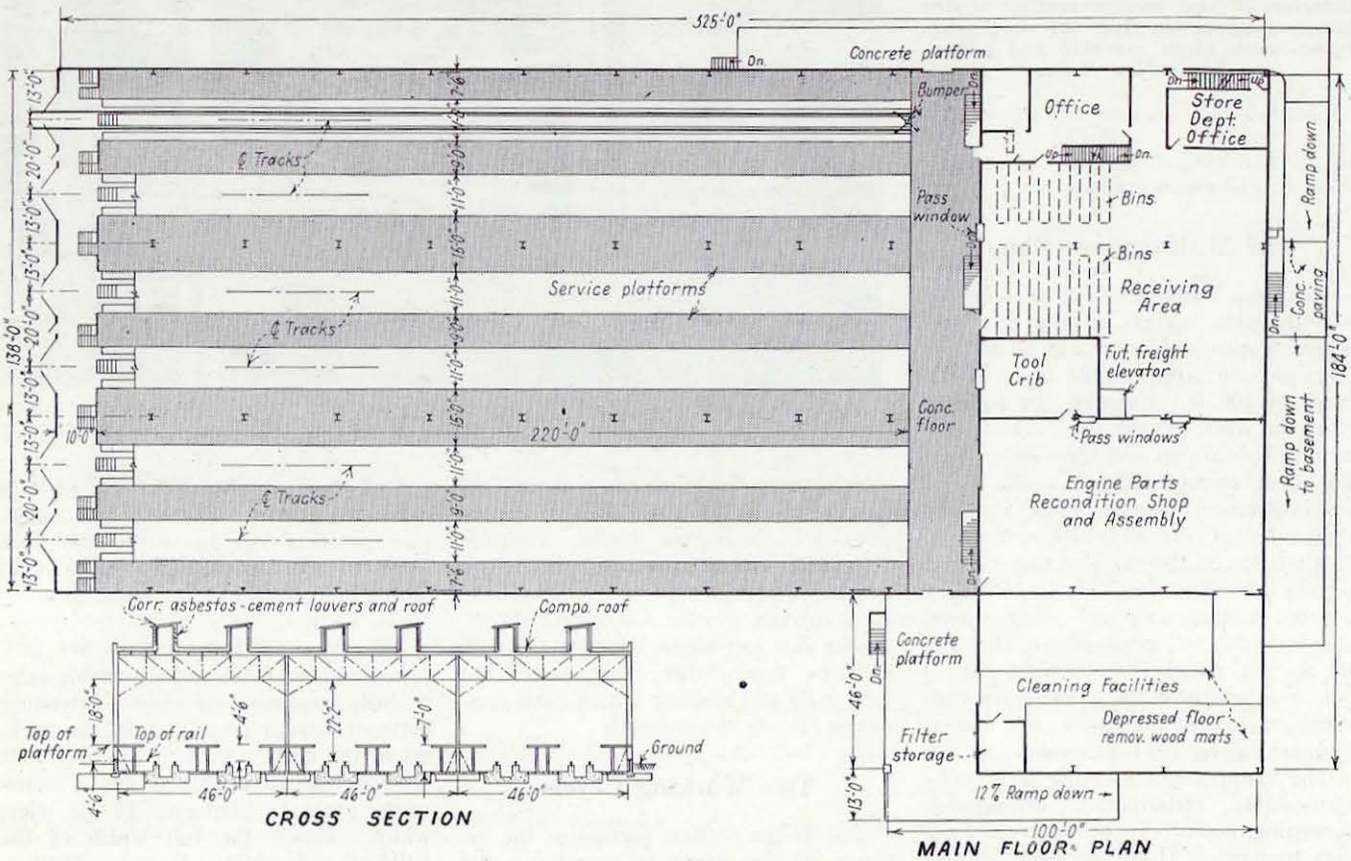
Two Working Levels

The design of that portion of the interior of the structure containing the tracks is based on a 220-ft. inspection pit for each track, capable of accommodating a complete four-unit locomotive, in conjunction with two working levels, one at the elevation of the locomotive floors and the other depressed 30 in. below the top of rail. The upper working level is in the form of five island platforms, three of which are 9 ft. wide and two 15 ft. in width, and a 7½-ft. platform along each side wall. These platforms are of all-metal construction, with posts made from old boiler flues supporting steel beams and channels carrying a deck consisting of 5/16-in. steel plates which were obtained from the bottoms of old oil storage tanks. To the edge of each platform is welded a steel plate that projects 1½ in. above the deck level. The platform decks are covered with a non-skid surfacing material about 1/32 in. thick.

The sides of the platforms are protected with movable and adjustable safety rails consisting of chains extending between tubular posts that fit into sockets in the deck. At their easterly ends the longitudinal platforms join a transverse concrete platform, 18 ft. wide, which extends the full width of the building and which adjoins a partition separating the two portions of the structure. This partition is pierced by several door openings, including one 8 ft. wide that is fitted with a steel rolling door. At each end of the transverse platform there is an 8-ft. steel rolling door in the outer wall, leading to an exterior concrete platform connected by ramps to the ground and basement levels.

The inspection pits in the shop building are of concrete construction and each is cast integrally with a continuous jacking pad along each side. The pits are 3 ft. 7 in. wide on the inside, and are 4 ft. deep measured from top of rail. The

View of the shop building from the east and south. Note the use of ramps between the platform, ground and basement levels



Floor plan of the shop building at the upper working level, and cross-section through the service portion of the structure

floors of the pits, which have gutters on both sides, are pitched to drainage sumps covered with cast iron gratings, which are placed at intervals of 55 ft. Bumping posts are provided at the easterly ends of the pits.

Many Ramps Used

At the westerly end of the shop building there is a space 10 ft. wide between the ends of the pits and the west wall, which has a concrete floor level with the tops of the rails. Stairways give access from this level to the pits, to the depressed floor areas between pits, and to the platforms overhead. At the opposite, or easterly, ends of the pits, stairways lead down to the basement level under the easterly portion of the building, while the depressed areas between the pits are connected with this level by ramps with grades of 1.58 in. per foot. By the use of ramps here and elsewhere in the building, materials or parts can be trucked between any points of origin and use, such as from the storerooms, or from cars spotted along one of the outside platforms, to either the upper or lower levels in the service section.

Other facilities in this section of the shop building include the necessary piping and outlets at each pit for supplying locomotives with lubricating oil and cooling water. By means of steam coils in the storage tanks both the lubricating oil and the cooling water are pre-heated, the oil to a temperature of 150 deg. to 180 deg. F. and the water to a temperature of 150 deg. F. The necessary piping and outlets are also provided for draining water and oil from the cooling systems and the crank cases of the locomotives.

Cooling Water Reclaimed

Since the distilled water used in the cooling systems is produced at a cost of about $10 per 1,000 gal., it is considered economical to reclaim the water that is removed from the locomotives. This is done by draining it into a sump, from which it is pumped into a settling basin inside the storage tank for distilled water. Similarly, the waste oil removed from the crank cases of locomotives is delivered to a storage tank, from which it is later withdrawn and shipped to Topeka, Kan., for reclaiming.

Artificial light for general illumination in the service section of the shop is provided for by means of incandescent lighting fixtures suspended overhead. However, illumination underneath the platforms is by means of fluorescent lights, the reflectors of which are arranged at such an angle as to direct the rays towards the tracks and the running gear of locomotives spotted on them. The pits are lighted by recessed fixtures in the side walls.

The basement area under the easterly portion of the building is largely open, except for the supporting columns and for the further fact that the toilet and locker rooms for employees are arranged along the east wall of this level. A number of stairways are placed at convenient locations to connect the basement with the first-floor level and to give access to it from the outside. In the east wall of the basement, a large double-door opening, fitted with sliding doors, connects with a ramp extending up to the ground level, from where other ramps give access to the exterior platforms at the level of the main floor.

Facilities on Main Floor

Facilities contained on the main floor of the easterly portion of the building include a room for cleaning engine filters and other parts; a room for the reconditioning and repairing of various engine parts, such as pistons, cylinder liners, cylinder heads, water pumps, lubricating oil pumps and electrical equipment; a room for receiving and storing engine parts, which includes an enclosed tool crib; and office space, the latter be-

ing located along the north wall. A mezzanine area at this same location contains toilet facilities for office employees and space for office files.

The cleaning room, which occupies the entire projecting wing at the southeast corner of the building, is approximately 46 ft. by 75 ft. in plan. A feature of this room is that considerable areas of the reinforced concrete floor are depressed, being pitched to suitable drains, and are covered with timber grating. In the west wall of this room is a steel rolling door opening onto an exterior concrete platform, which has a ramp down to the ground level.

Adjacent to the cleaning room, and connected to it by a steel rolling door, is the room for repairing and reconditioning engine parts, and beyond this space is the receiving and store room, also reached through a steel rolling door. Interior partitions in this portion of the structure have metal studs and plaster on metal lath, except that the walls in the engine parts shop are protected by a 5-ft. wainscoting of steel plates. In the case of the partition between this room and the receiving area, the area above the 5-ft. level is covered with bunker screen.

The tool crib, which occupies a corner of the receiving area, is separated from that room by partitions 10 ft. high, in which the steel studs are covered with metal lath and plaster on the outside to a height of 5 ft., and with wire mesh above this level. The ceiling of the tool crib consists of metal joists covered with bunker screen. Windows for passing items to and from the tool crib are provided in the partitions separating it from the service portion of the building, and from the engine parts repair room, and similar windows are provided in several other locations. Interior partitions in that portion of the structure containing the offices are of plaster on wood lath and studs, except that at certain locations on the sides of these partitions facing the receiving area and a passageway for trucks they have 5-ft. wainscots of steel plates.

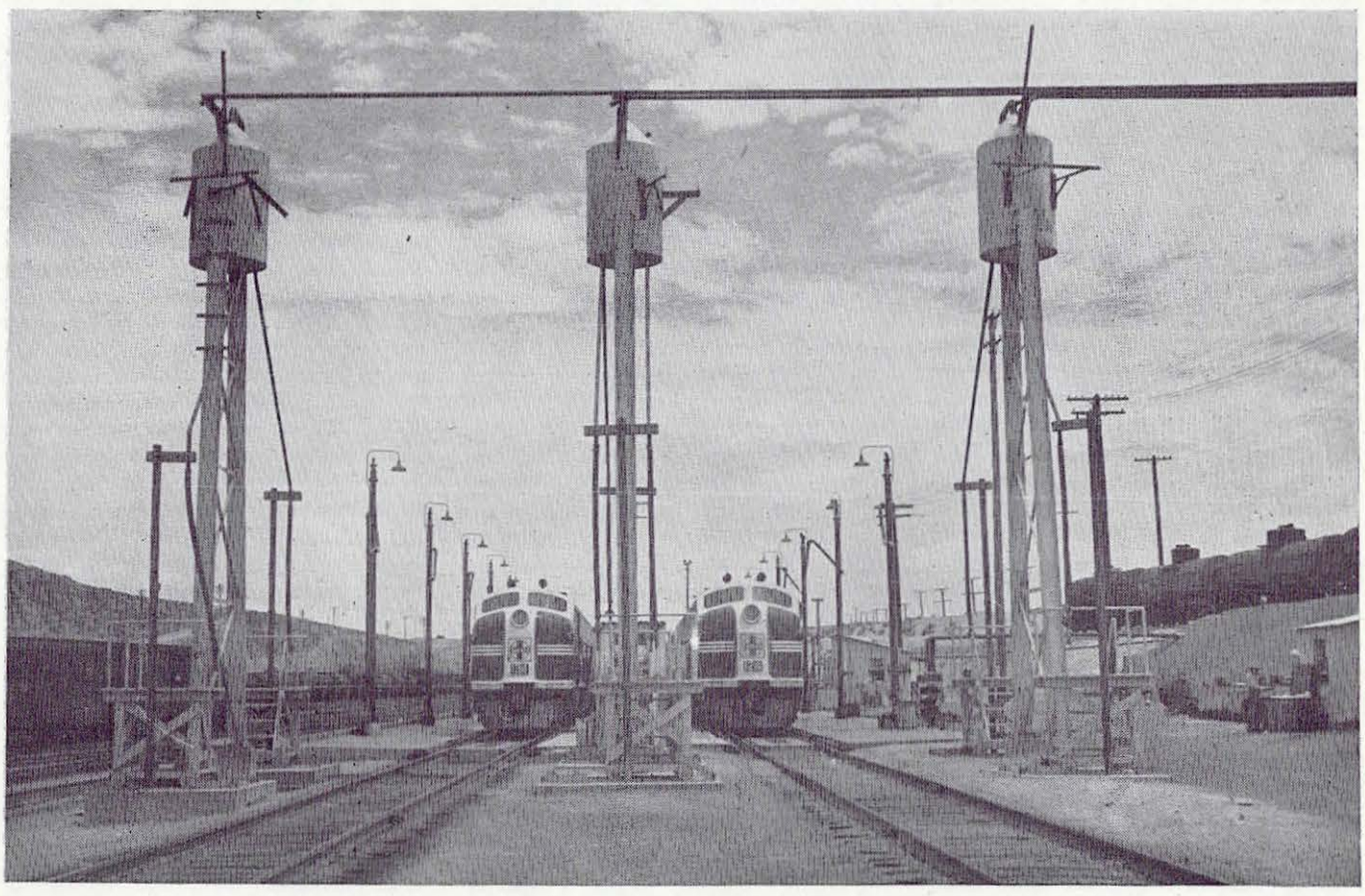
For changing out the trucks of the Diesel locomotives a transfer table was built at a point on the south side of the shop building near its west end. This table has a concrete pit, which is constructed in conjunction with a concrete inspection pit 90 ft. long.

The Fueling Platform

The locomotive fueling and washing platform at Barstow has a number of interesting features. This is a concrete platform 52 ft. wide and 270 ft. long. As already indicated, the platform serves two tracks which divide it into three parts. Arranged along each of the outside portions, at a distance of 12½ ft. from the center line of the nearest track, are five fueling cranes placed 40 ft. apart. Each of these cranes embodies a 6-in. vertical pipe, 23½ ft. high, to which is fastened a 3-in. fuel-oil riser pipe that extends 16½ ft. above the platform level. Attached to the top of the riser pipe by means of a flexible coupling is a counterweighted swinging section of 3-in. pipe, 6½ ft. long. To the end of this section is fastened a length of 2½-in. hose about 12 ft. long, the free end of which is provided with a 2½-in. gasoline-type pressure fuel nozzle.

When the fueling hose of each crane is not in use the swinging section of the pipe is held by the counterweight at an angle of about 45 deg. with the vertical, and in a position approximately parallel with the track, so that the hose hangs freely with its lower end well out of the way of movements on the platform. To fuel a locomotive the hose lengths are simply pulled down and around as necessary to permit the nozzles to be attached to the fuel-tank inlets; when this operation has been finished and the hose released they return automatically to the raised position, clear of the platform.

For cleaning the running gear of locomotives, a Sellers steam-jet system has



The double-track fueling platform at Barstow with sanding facilities in the foreground

The automatic wash rack in operation

been installed with outlets placed at various locations along the platform so that all external parts of the running gear are readily accessible for cleaning. Also incorporated in the platform is an automatic wash rack for cleaning the sides of the locomotives. In addition, each track has eight outlets (four on each side) for delivering distilled cooling water to the locomotives, and four outlets for filling the flush tanks of the locomotive toilets. The fueling platform is illuminated for night work by means of lights with reflectors at the tops of the posts supporting the fuel cranes.

So that the locomotives can be supplied with sand as they are leaving the fueling platform, the sanding plant is placed directly at the west end of this platform. Embodied in the sand plant are three 3-cu. yd. elevated storage tanks, and two sanding hoses on each side of each track. To permit attendants to reach the inlets to the sand boxes on the locomotives, movable elevated platforms are provided. So that it can be moved into the clear when not in use, each platform is mounted on a set of flanged wheels that operate on a track placed at right angles to the locomotive tracks. Sand for the Diesels is obtained from the existing drying plant at Barstow and is hauled in trucks to the Diesel sand plant, where it is dumped into a pressure tank, housed in a small shelter, from which it is transferred by compressed air to the elevated storage tanks.

Fuel Handling and Storage

The Diesel installation at Barstow includes a comprehensive system for unloading and storing fuel oil and for delivering it to the loading cranes at the fueling platform. This oil is unloaded from tank cars by means of five overhead cranes which siphon it out after flow is started by hand-operated rotary pumps. The oil is first delivered to a 7,500-gal. unloading and rehandling tank, from which it is pumped into a 55,000-gal. storage tank. For this purpose two turbine pumps, each with a capacity of 200 gal. per min., are provided, which are located in a pump house and are controlled by a set of push buttons at the rehandling tank. From the storage tank the oil flows by gravity back into the rehandling tank, this flow being controlled by an air-operated float valve in the latter tank. A motor-driven compressor furnishes air for the operation of this valve in the event there is a failure of the yard supply.

Fueling Tank Underground

From the rehandling tank the oil is delivered to a 15,000-gal. underground fueling tank located near the fueling platform. For this purpose either of the two turbine pumps mentioned above may be employed, using a push-button control placed in the pump house. Delivery of the oil from the fueling tank to the outlets at the fueling platform is accomplished by two 500-gal. per min. turbine pumps with floating suction, which likewise have push-button control. In moving from the storage tank to the outlets, the oil passes through a basket-type strainer, a deaerator, and three oil filters which are arranged in parallel to minimize resistance and to permit one of them to be cut out for cleaning while retaining the other two in operation. Also, a meter is provided to measure the amount of oil issued.

The plant that has been installed at Barstow for producing distilled cooling water for the Diesel locomotives is a single-unit evaporator having a capacity of 17,000 gal. per day, with provision being made for the addition of a second unit at a later date, which will increase the capacity to 26,000 gal. per 24 hr., without the use of additional steam. Like the plant at Winslow, it is automatically controlled and embodies means of adding a soluble oil to the distilled water to prevent it from causing corrosion in the locomotives.

From the producing plant, which is located in an addition to the existing power house, the distilled water is pumped through a 2½-in. overhead insulated pipe line, 2,000 ft. long, to a 27,000-gal. storage tank located near the maintenance shop. This tank is enclosed in a 2-in. jacket of cork insulation and, as already indicated, contains steam coils for pre-heating the water, which are automatically controlled.

Lubricating oil for the Diesels is stored in four 15,000-gal. tanks, three of which are for new oil and one for the waste oil that is to be reclaimed. The three tanks for new oil, which also contain automatically-controlled steam coils for heating it, are insulated, as is the elevated pipe line for delivering this oil to the maintenance shop.

Fire Protection

The matter of fire protection for the Diesel facilities at Barstow has been given careful attention. For fire protection generally the existing cast iron piping system at the terminal was extended to form a loop of 6-in. pipe around the maintenance shop and other facilities. A covered metal hose reel equipped with 200 ft. of 2½-in. hose is provided at each hydrant, and all hydrants situated close to oil facilities are equipped with fog nozzles. Ample pressure for fire-fighting purposes is provided by the existing 2,500-gal. per min. fire pump in the power house. In addition, two portable 40-gal. Foamite engines have been installed in shelters near the oil facilities, and all oil storage and rehandling tanks are supplied with Underwriters' approved equipment for protection against fire due to lightning or other causes.

The design and installation of the Diesel facilities on the Santa Fe's Coast Lines were carried out under the general direction of G. W. Harris, chief engineer of the Atchison, Topeka & Santa Fe System, Chicago, and B. P. Phelps, engineer of shop extension, Topeka, Kan., and under the immediate supervision of M. C. Blanchard, chief engineer of the Coast Lines, Los Angeles, Cal.

The new buildings and the alterations to existing structures were designed under the direct supervision of H. L. Gilman, architect for the Coast Lines, while the design of the fuel oil and water facilities were supervised by G. L. Davenport, hydraulic engineer of these lines.

GENERAL NEWS

Capital Expenditures up Slightly in 1945

Total was $562,980,000 an increase of $2,868,600 over previous year

Capital expenditures for equipment and other improvements to railway property made by Class I railroads in 1945 totaled $562,980,000, the greatest for any year since 1930, according to the Association of American Railroads. Expenditures in 1945 were an increase of $2,868,000 above those in 1944.

Of total capital expenditures made in 1945, $314,779,000 were for locomotives, freight-train cars, passenger-train cars and other equipment, and $248,201,000 for roadway and structures. Capital expenditures for equipment were a decrease of $13,452,000 and those for roadway and structures were an increase of $16,320,000 compared with 1944.

Expenditures for Equipment—Capital expenditures for locomotives in 1945 totaled $127,934,000, compared with $178,017,000 in 1944. For freight-train cars, capital expenditures amounted to $138,114,000, compared with $134,533,000 in 1944. For passenger-train cars, the amount of capital expenditures totaled $30,843,000 in 1945, compared with $$1,921,000 in 1944, which was the smallest figure reported for such expenditures since statistics have been collected. In 1942 the amount was $24,075,000. Expenditures for other equipment in 1945 amounted to $17,888,000, compared with $13,760,000 in 1944.

Of the $248,201,000 spent for roadway and structures, more than $91,000,000 were used for improvement of tracks and sidings. For additional track, capital expenditures in 1945 totaled $15,566,000 compared with $20,616,000 in the preceding year. For yards and sidings, expenditures in 1945 totaled $31,733,000 compared with $36,666,000 in the year before, and for heavier rail the railroads spent $37,579,000, or an increases of $1,859,000 above such expenditures in 1944. In addition, the railroads spent $6,343,000 in 1945 for additional ballast and $24,364,000 for bridges, trestles and culverts.

Expenditures for shops and engine houses in 1945 amounted to $38,243,000, or an increase of $10,112,000 above the year before; and for station and office buildings and other station facilities, $14,549,000, an increase of $1,116,000 above the like expenditures in 1944. For signals and interlockers, including telephone and telegraph lines and automatic train control, they expended $30,039,000 in the past calendar year, an increase of $7,948,000 above 1944; and for other improvements, $49,785,000, which was an increase of $6,646,000, compared with the year before.

Outlays Since 1930—The A. A. R. statement gave the capital expenditures made annually by Class I roads in the past 16 years as follows:

1945	$562,980,000
1944	560,112,000
1943	454,282,000
1942	534,897,000
1941	543,021,000
1940	429,147,000
1939	262,029,000
1938	226,937,000
1937	509,793,000
1936	298,991,000
1935	188,302,000
1934	212,712,000
1933	103,947,000
1932	167,194,000
1931	361,912,000
1930	872,608,000

More detailed data for expenditures in recent years, including 1945, for the principal equipment and roadway items are shown in the accompanying table.

GROSS CAPITAL EXPENDITURES (In Thousands) ON RAILWAY PROPERTY—1941 to 1945*

Class I Railways—United States

Item	1945	1944	1943	1942	1941
EQUIPMENT:					
Locomotives	$127,934	$178,017	$142,070	$113,834	$80,607
Freight-train cars	138,114	134,533	97,890	201,112	245,713
Passenger-train cars	30,843	1,921	5,828	24,075	29,544
Other equipment	17,888	13,760	10,193	10,353	11,704
Total Equipment	$314,779	$328,231	$255,981	$349,374	$367,568
ROADWAY AND STRUCTURES:					
†Additional main track	$15,566	$20,616	$18,493	$6,235	$3,781
Yards and sidings	31,733	36,666	39,254	43,330	25,374
Heavier rail	37,579	35,720	32,227	33,100	36,108
Additional ballast	6,343	6,997	6,229	5,487	5,635
Shops and engine houses (including machinery and tools)	38,243	28,131	15,615	13,623	13,920
Station and office buildings and other station facilities	14,549	13,433	10,320	10,623	11,251
Bridges, trestles and culverts	24,364	25,088	20,673	21,471	19,419
Signals & interlockers, including telephone & telegraph lines, atuomatic train control, etc.	30,039	22,091	16,041	16,261	13,439
All other improvements	49,785	43,139	39,449	35,393	46,526
Total Roadway and Structures	$248,201	$231,881	$198,301	$185,523	$175,453
Grand Total	$562,980	$560,112	$454,282	$534,897	$543,021

*Compiled by the Bureau of Railway Economics, Association of American Railroads.
†Includes rail and tie fastenings and other track material.

Lea Questionnaire Draws More Replies

Views of Chamber of Commerce, air carriers and government employees given

A report on the National Transportation Policy, recommending, among other things, further "appropriate" cooperation between the various forms of transportation, has been submitted by its Transportation and Communication Department to the membership of the United States Chamber of Commerce for consideration at the next annual meeting of that body, which begins April 30 at Atlantic City, N. J. This report, prepared in response to the "questionnaire" distributed by the House committee on interstate and foreign commerce as a means of obtaining comment to guide the formation by it of a legislative program to bring about a better realization of the principles adopted by Congress as the national policy with respect to transportation, is one of three replies to the committee which recently have become available. The others were prepared by the Air Transport Association of America and the Federal Transportation Association.

The Chamber of Commerce department report, which of course does not commit that body to the propositions set forth in it in advance of its formal approval, suggests a "broadening and strengthening" of the statement of the national policy, and its "effective implementation" in certain respects, but it does not discuss all the questions raised in the committee "questionnaire."

Transport Problems Still Here—"The end to active hostilities has not brought an end to transportation problems," the report observed, "or to the importance of the continued effective functioning of the carriers in the public interest. As this country returns to a peace-time basis, with the fundamental adjustments in the national economy necessitated thereby, the ability of the carriers to transport all proffered passengers and goods safely, efficiently and expeditiously, at reasonable rates to all concerned, will be a major factor in maintaining employment, payrolls and prosperity throughout the length and breadth of the land. Inability to meet those tests will cause vast harm. Thus, it is of direct concern to every citizen, and especially public authorities and business men, that our national transportation system goes forward and not backward in the post-war years."

Noting that practically all carriers came out of the war period with impaired facilities, due to deferred maintenance, shortages of materials and inability to obtain new

(*Continued on page 780*)

More Car Orders Are Coming, Says Betts

Total on order may run up to 150,000, but delivery is "problematical"

"In the light of heavy demands for all kinds of cars to meet impending peace-time production, railroads have on order or in the process of being ordered in excess of 30,000 box cars and over 60,000 cars of all types," L. M. Betts, manager of the Railroad Relations Section, Car Service Division, Association of American Railroads, told a meeting of the Atlantic States Shippers Advisory Board at Rochester, N. Y., on April 11.

Mr. Betts said that under recommendations of the A. A. R., consideration is being given to the ordering of a considerable additional number that is expected to produce a total of 125,000 to 150,000 cars on order.

Will Protect Traffic—"The number of cars that can be obtained is problematical," he added. "The continued shortage of lumber and the extremely tight situation as to all kinds of steel parts, together with continued labor uncertainties, militate against the securing of full productive capacity of the car builders. It can be stated unqualifiedly, however, that the railroads propose to provide sufficient cars to protect the traffic offered them to the full extent of their ability.

"Freight car supply conditions throughout the United States have improved materially," he said. "There is at present no car shortage for any type of equipment, although supply continues close. This favorable situation can be maintained, however, by prompt handling by carriers and shippers."

The speaker said that the most pressing requirement for box cars continues to be the overseas grain movement to assist in relieving famine in Europe and Asia. "There are no country elevators filled with grain because of the lack of transportation," he continued. "The government's program for export grain during March was approximately one million tons, with actual shipments amounting to 976,300 tons. This was in addition to grain products shipments totaling approximately 400,000 tons. The April movement will depend upon the amount of grain which can be secured, the program having been modified to offer farmers a guaranteed payment of the highest price prevailing during any time in the next year for all grain delivered now.

Heavy Box Car Loadings—"Box car demands in the East have increased materially and last week's loadings were the highest on record. This applies to the territory as a whole and most of the larger railroads, including the New York Central, the New York, New Haven & Hartford and the Pennsylvania.

"Box car loadings as a whole are averaging 378,000 per week, which equals peak loadings during the fall of 1945 and exceeds loadings which prevailed immediately prior to V-J Day. Analysis of the commodities covered shows that box car loadings for the 1946 second quarter will be as great, if not greater, than they were a year ago and there is every indication that the movement of all agricultural products during the coming summer will be at maximum levels."

Mr. Betts said that the demand for automobile type box cars has increased with the resumption of production in the auto plants, but that the traffic has continued light. He said the supply of freight cars suitable for loading autos and parts has continued to protect all requirements.

"Specialized demand for ventilated box cars will shortly ensue in the southeast for the loading of potatoes and watermelons," he added. "Special directives have been issued for the expedited return of ventilated cars to this territory. Stock cars are in active demand in connection with the spring range movements in the Southwest, the peak for which will be reached around May 1. In addition, there is a heavy movement of cattle and domestic animals from western territory for export to Europe through Atlantic ports."

Eased by Strikes—The speaker said that there is a "fairly easy" supply of coal cars which he attributed to the miners' strike. He added that cars used for loading steel products are in excess also because of labor difficulties. He also reported an abundance of flat, gondola and hopper cars.

"Prior to the suspension of coal loading in the bituminous fields, the coal tonnage loaded on railroads this year exceeded all previous records since the first quarter of 1927, where there was stimulated production because of the coal strike in England and when coal car ownership was 90,000 greater than at the present," he said.

Mr. Betts told the group that carloadings were at an all-time peak level during the first quarter of 1946 and that prospects indicate that April loadings will continue at the same comparatively high level. He said there is no shortage of refrigerator cars in any part of the country.

"The percentage of freight cars retired during the past year has increased," he concluded, "although not yet up to a figure that would be considered normal under conditions of lighter demand. Total box cars retired in the past year were 3.5 per cent of ownership and all cars 2.9 per cent, representing approximately 26,000 and 52,000 cars, respectively. Installation of new cars did not quite equal retirements, causing a net loss of 6,400 box cars and 12,600 cars as a total. The shortage of materials, in addition to labor difficulties, has resulted in an increase of cars awaiting repairs, which means a further reduction from the serviceable supply of 11,000 box and 23,400 total cars."

Full Production by April 30 At Electro-Motive Plant

Termination of the strike against the General Motors Corporation by the United Auto Workers (CIO) has permitted resumption of manufacturing schedules at the Electro-Motive division's Diesel locomotive plant at LaGrange, Ill. However, due to the nature of the work, normal production rates will not be reached much before the end of the month, according to a spokesman for the company.

Hearings Completed by Emergency Board

Board given until April 20 to make its report to the President

The presidential emergency board, that is to make recommendations as to the demands of the Brotherhood of Railroad Trainmen and the Brotherhood of Locomotive Engineers for a wage increase of $2.50 per basic day or 25 per cent, and changes in 45 working rules, completed the taking of evidence and the hearing of final arguments on behalf of the disputants, on April 8. Under an agreement of the parties, the board is required to complete its study of the evidence and report to the president on or before April 20.

At the afternoon session on April 1 the board heard oral statements and accepted written ones in behalf of numerous railways not represented by the Carriers' Conference Committee. The carriers asking to be excluded from these hearings were the Norfolk Southern; Midland Terminal; Oregon & Northwestern; Mississippi Central; Columbus & Greenville; Beaver, Meade & Englewood; Hudson & Manhattan; Chicago, North Shore & Milwaukee; and Chicago, Aurora & Elgin.

C. N. J. Situation—The Midland Terminal, Meridian & Bigbee River, and Central Railroad of New Jersey each asked that the board give special consideration to conditions prevailing on their lines. William Wyer, chief executive officer of the C. N. J. said, as did the representatives of all of the carriers asking separate appearances or requesting to be excused, that these unions had failed to comply with the Railway Labor Act in that they had refused to bargain for individual adjustments and that their representatives, in presenting the union proposals were not empowered to reach a decision with the management other than full acceptance of the union proposals.

Referring to operating and wage conditions on the C. N. J., Mr. Wyer declared that he favored high wages but that if high wages are paid, high productivity must go with them. He asserted that in his opinion the roads are not getting a full day's work from many employees, especially those in train and engine service, and asserted that the cost of the proposed rules changes of the employees is a serious threat to the continued operation of the C. N. J. as a privately conducted enterprise. Admitting that the proposed changes would hit the C. N. J. harder than most other Class I roads, Mr. Wyer said that this was due to the high proportion of suburban and terminal operations to its total revenues and to the fact that two-thirds of its mileage lies within New Jersey, "a state whose railroad taxing system is notoriously by far the most exorbitant of all the states in the union." The total cost to the Jersey Central of the proposed rules and wage changes, he said, would be $11,208,827, of which nearly $5 million is due to rules changes. On the basis of current opera-

tions, he estimated that this added expense would result in an annual deficit in excess of $15.6 million.

Concerning the effects on earnings of the proposed working rules, he said that if adopted they would result in increases of take home pay to employees in suburban and terminal services ranging from 40 per cent to 100 per cent, as compared to increase of 10 or 20 per cent on other carriers. Mr. Wyer told the board that during the last five years there have been ten major abandonments of service on the C. N. J., which have eliminated the jobs of 467 employees, partly due to high taxes imposed by the state of New Jersey. "If the situation which arises out of the wage and working rules proceedings is one which is intolerable to the Jersey Central, the abandonment of additional facilities and services will be stimulated accordingly," he declared.

Some Burdensome Rules — Concerning the carrier proposals for rules changes, Mr. Wyer said that there were three of particular importance to the C. N. J.; viz., the one involving handling freight in passenger trains, for which the C. N. J. must now pay local freight rates of pay to the entire crew to handle even a small package of stationery in this manner; time limit on claims, which the road has paid in the past year or has pending in the amount of approximately $1 million, and dating back to 1930; and reduction in crews-passenger service, for which the C. N. J. must in one instance pay two crews each a full day's wages for individual round-trip runs of 56 miles, between the same two points, which could otherwise be handled with one crew under the present "8 within 10" rule. He also declared that present rules in effect on the C. N. J. required the employment of baggagemen on runs on which baggage is not handled.

Mr. Wyer's general recommendation with respect to rules was that the board adopt one of these five procedures:

1. Recommend that changes in the rules continue to be worked out on a road-by-road basis, where due consideration can be given to the different problems of each railroad. This, he said, was the most practical course to follow.
2. If it should be decided to change rules on a national basis, a board should be appointed that would have time to study the problem in sufficient details so that its recommendations, if placed in effect, "would not be fatal to a road like the Jersey Central."
3. If national rules changes are to be recommended at this time, they should be designed so as not to be unduly burdensome on roads with a preponderance of suburban and terminal services.
4. If rules should be recommended nationally which do place heavy burdens on suburban or terminal services, separate rules should be recommended for the C. N. J., in the light of its peculiar operating and traffic requirements.
5. If separate rules are approved in principle for the C. N. J., negotiations of these rules should be remanded to the road and its own employees.

The hearings were continued on April 2, with further presentation by carrier witnesses of evidence relating to both the employees' and the roads' various proposals for changes in working rules. L. D. Comer, director of employment of the Atchison, Topeka & Santa Fe, was the first witness at the session, telling the board of the carriers' desire to establish the so-called "single-time basis of pay." Mr. Comer declared, "The carriers merely seek by their proposal to receive from the men the services for which they are paying. That, in other words, means that a man be paid one day's pay for one day's work, no more, no less." He asserted that "single-time pay" is almost universally recognized in industry, adding that he knew of no industry other than the railroads pay an employee more than once for doing a job.

Deadheading—Daniel P. Loomis, executive director, Association of Western Railways, followed Mr. Comer, testifying in regard to the carriers position on rules governing deadheading and pay for deadheading, qualifying, attending courts and investigations, and for held-away-from-home-terminal time. Mr. Loomis told the board that studies had indicated that the held-away-from-home-terminal rule alone would cost the carriers at least $25.5 million annually and further charged that the proposed rule contained within it a provision which would effectively prevent the roads from revising their operations so as to reduce these proposed penalties.

Mr. Loomis' final testimony presented the carriers' answer to the employees' contention that basic standard daily rates in engine, train and yard service in Western territory be increased to equal those in the East and Southeast. Mr. Loomis said that the present differentials arose in 1928 as a result of a decision of the trainmen to accept a pay increase of 6½ per cent plus the retention of the "Western double-header rule" in lieu of an increase of 7½ per cent that was given railway employees in the East and Southeast, and charged that these employees were now seeking to abrogate their 1928 agreement, without at the same time admitting that the roads had a corresponding right to eliminate the concessions they had granted in return. He further asserted that the employees were unwilling to give up certain other special rules in the West which made the average rates in that territory higher than in the other two regions in spite of the difference in basic daily rates.

J. W. Smith, vice-president of the Boston & Maine and Maine Central, was the final carrier witness for the day and presented the carriers' position with respect to proposed rates of pay for yard switchtenders and for yard conductors. He declared that the proposal to give yard switchtenders yard brakemen's rates of pay would add $1.6 million annually to operating expenses and that the proposal to increase the differential between yard conductors' and yard brakemen's rates of pay to not less than $1.50 per basic day would add $7.7 million more to operating costs.

Pay for Miscellaneous Services—Mr. Comer was re-called as the first carrier witness on April 3, to present testimony outlining the roads' position as to rates of pay for miscellaneous services, such as local freight, mine run, snow plow, pusher, helper, roustabauot, road switcher, work, wreck, construction and unclassified in which the employees requested local rates for trainmen performing service of these types. The effects of this rule, if adopted, he said, would be to increase the wages of men engaged in the performance of miscellaneous services by at least 6 per cent. In summing up the entire wage and rules proposals of the employees, Mr. Comer declared, "In this same proceeding, the organizations are seeking straight wage increases of 25 per cent with not less than $2.50 a day. They also seek an extra day's pay for performing various incidental services such as making side-trips or lap-backs, or performing more than one class of service. They also ask for increased arbitrary payments for delays at initial and final terminals. All of these increases bring the payments up to the point that can be described in no other way than fantastic."

Frank A. Stoops, assistant to general manager of the Pennsylvania, followed Mr. Comer as a witness presenting the carrier's statement concerning the proposal that pay for engineers commence with that paid for the weight on drivers classification of 300,000 lb., which would, in effect, eliminate the present six lowest pay graduations for engine crews. Mr. Stoops declared that based on actual operations in the week of January 6, 1946, this proposal which applies to engineers, firemen and hostlers would cost the carriers in excess of $21 million annually, with the greatest portion of the increase occurring in yard service.

The final carrier witness for the day was L. W. Horning, vice-president personnel and public relations of the New York Central, who told the board of the carriers' position on various rules relating specifically to passenger service. Mr. Horning in discussing the effects of the proposal that the basic day for passenger trainmen be 100 miles or 5 hr., instead of 150 miles or 7½ hr., as at present, said this would increase the wages of these men by an average of 34 per cent and of those assigned to runs of 150 miles or more by 50 per cent. He said it would also disturb the relationship between the wages paid passenger trainmen and those paid passenger enginemen so as to result in future heavy wage demands by the latter.

The Short Turnaround Rule — Mr. Horning also told the board that the proposed short turnaround rule would increase the number of men in commutation service who receive overtime from 65 per cent at the present time to 87 per cent and that it would not serve to reduce the number of hours worked by the men as claimed by the employees, since the mid-day traffic simply did not exist in sufficient volume to permit rescheduling of the trains as witnesses for the unions had suggested. The witness also called attention to the earnings that would result if the above two changes, plus one calling for time and one-half in passenger service after five hours were in effect, citing earnings on a typical suburban assignment on the Pennsylvania in which the conductor's present daily earnings would be increased from $14.25 to $35.88 on week-days, or 151.8 per cent and to $44.37 on Sunday, or 211.4 per cent. On this same run, the engineer's earnings would be increased from $17.60 to 22.60 on week-days, or 28.4 per cent, and to $33.90 on Sunday, or 92.6 per cent.

Mr. Horning added that this was a good example of a situation that would cause the enginemen to demand further wage adjustments so as to maintain their present differential over the trainmen. Summing

up the total effects of these three proposals, he declared that they would add $55 million annually to operating expenses, the burden of which would be borne almost entirely by those few roads operating commuter train services. Mr. Horning also discussed the carriers' proposed rules with respect to monthly guarantees in passenger service and the employees' proposal dealing with increased compensation to motormen on multiple-unit trains, according to the number of motor cars in the train.

Mr. Horning also told the board that the proposal of the unions that all yard train and enginemen, including extra men, be paid at time and one-half rates for work in excess of 8 hr. in any 24-hr. period would cost the carriers about $5 million annually, and would cause them to be more strict in allowing employees time off to attend to personal business when employment of a substitute would require the payment of penalty wage rates. He also charged that the proposed sick-leave rule of the employees was ambiguous and could lead to payments for illnesses on days when the employee would not normally be at work, was difficult to police, and would lead to endless argument and litigation.

Many Rest Days—In his final testimony for the day, Mr. Horning gave the board the carriers views on the proposal to pay time and one-half for holiday and Sunday work. He asserted that the railroad transportation employees are the only large group of workers in the country that are privileged to earn their monthly wages within 15 to 25 days and that they have more rest days per month than any other group of workers of which he had knowledge, adding that Sunday and holiday work in the industry was the result of public demand rather than of the desires of the carriers. He declared that the proposal, if adopted would cost the carriers, at 1944 employment levels, at least $77 million a year.

Final carrier evidence was given on April 4, at which hearing Mr. Horning returned to the stand as the initial witness for the day. He told the board that night differentials had been eliminated in the train service in 1919 at the request of the B. of R. T. and did not exist in any craft employed on the railways. He further declared that the proposal was not entirely clear in its application, but that carrier studies had indicated that the cost in local train and yard service alone, based on 1944 hours, would exceed $20.5 million. Mr. Horning's final testimony dealt with the employees' requests for office space for conductors on passenger trains and for free uniforms and cleaning and pressing service for passenger trainmen. The latter item, Mr. Horning estimated, would cost the carriers about $2 million annually, of which $1.3 million would be for cleaning and pressing.

The next carrier witness was E. B. Perry, manager of personnel of the New York, New Haven and Hartford, who first outlined to the board the carriers' reasons for desiring certain limitations on payments for back wages due to changes in the interpretations of various contract rules, on payments for runarounds, and on payments for time lost. He also gave the board the carriers' views on the appointment of yardmasters and road foremen of engines. Mr. Perry was followed by Claude S. Wilcox, road foreman of engines on the Pennsylvania, who testified with respect to the proposal that electric lights, awnings, windshields and "adequate" seats be installed on locomotives and cabooses, and regarding the demands that the carriers furnish employees with watches at cost, and pay for cleaning and repairing watches, and to pay the employees a minimum of 2 hr. for each watch inspection.

On Rules for Diner Employees—Edwin R. Davis, assistant to the general superintendent of dining cars of the Pennsylvania, next told the board of the effects of the proposed union rules covering dining car employees. Mr. Davis declared that the proposal to pay dining car stewards on an hourly rather than a monthly basis would either increase their individual earnings by an average of 95 per cent on the basis of present assignments, or else would require, if runs were rescheduled, an increase of more than 60 per cent in personnel with each employee performing an average of only 37½ per cent of the work they now perform. The final carrier witness in the initial presentation of evidence was C. D. McKay, assistant vice-president of the Southern. Mr. McKay told the board that the cost to the roads of granting in full the employees' proposals covering rates of pay, rest days, starting time, etc., of yardmasters would be nearly $14.5 million annually. The board also accepted in evidence transcripts of the testimony and cross-examination of F. G. Gurley, president of the Atchison, Topeka & Santa Fe; E. E. Norris, president of the Southern; G. Metzman, president of the New York Central; W. A. Johnston, president of the Illinois Central and R. V. Fletcher, vice-president, Association of American Railroads, which was taken before the two arbitration boards which recently granted wage increases of 16 cents an hour to 15 non-operating and three operating unions of employees.

At the conclusion of Mr. McKay's testimony, Harry L. House, a suburban collector on the Illinois Central, was called as a witness in rebuttal for the employees to testify regarding the proposed changes in the short turnaround rule. Henry P. Melnikow, economist for the unions, was the sole witness heard at the session on April 5, presenting rebuttal evidence concerning wage rules in behalf of the employees. Before hearing Mr. Melnikow, the board accepted from the carriers, over the objections of counsel for the unions, copies of the recent award of the two arbitration panels which heard the wage cases of the other 18 railway labor organizations.

Anti-Trust Angle—Following the completion of Mr. Melnikow's testimony, A. J. Bier, manager of the Bureau of Information, Southeastern Railways, presented a statement in behalf of the Atlantic Coast Line; Atlanta & West Point; Western Railway of Alabama; Atlanta Joint Terminals; Central of Georgia; Charleston & Western Carolina; Chesapeake & Ohio; Clinchfield; Florida East Coast; Georgia; Jacksonville Terminal; Kentucky & Indiana Terminal; Louisville & Nashville; Nashville, Chattanooga & St. Louis; Norfolk & Portsmouth Belt Line; Norfolk & Western; Richmond, Fredericksburg & Potomac; Seaboard Air Line; Virginian; and Winston-Salem Southbound. Mr. Bier said that each of these roads by reason of their fears that, under certain decisions of the Supreme Court of the United States, they could be prosecuted for violation of the federal anti-trust acts, has refused to join with other carriers in any concerted action in negotiating or mediating any of the wage and rules proposals under discussion. However, he said, each of these roads, without conferring any authority on the Carriers' Conference Committee to negotiate or make any agreement in its behalf, is willing to adopt as its own the evidence and arguments presented by the Carriers' Conference Committee. Mr. Bier added that, subject only to minor reservations, this position is also being taken by the Gulf, Mobile & Ohio.

Ray T. Miller, attorney, presented the final argument in behalf of the employees telling the board that the controversy involved rates of pay and working conditions of more than 350,000 railway employees engaged in train and engine service, and, in addition, certain dining car stewards and yardmasters. Of this group, he said, some 250,000 were members of either the Brotherhood of Locomotive Engineers or the Brotherhood of Railroad Trainmen. He said the National Mediation Board recognized the B. of L. E. as the designated representative of the engineers on 97 per cent of the mileage of the principal carriers of the country and of the firemen on a number of small roads. The B. of R. T. was said to be the recognized bargaining unit for the trainmen, except conductors on 99 per cent of the mileage, of the conductors on 14 per cent of the mileage, of the yard foremen, helpers and switchmen on 98 per cent of the mileage and of the dining car stewards on 69 per cent of the mileage.

During the past 20 years, Mr. Miller declared, these employees have received only "very moderate increases", which he listed as 7½ per cent on the eastern lines and 6½ per cent on the western and southeastern carriers in 1927, for enginemen; 7½ per cent for all trainmen and yardmen except road trainmen in western territory in 1927; 6½ per cent for road trainmen in the west in 1928; 5½ cents an hour for all in 1937; 9½ cents an hour in 1941; and 9 cents an hour, in two portions, in 1943, or a total of $1.92 a day, or 24 cents an hour.

Sees "Gross Inequities"—He declared that non-railroad employees' earnings had increased from 68.9 cents an hour in 1936 to $1.256 an hour in September, 1945, or 56.7 cents an hour, while hourly earnings, including overtime, of train, engine and yard service rail workers had risen from 85.9 cents a hour in 1936 to $1.133 an hour in September, 1945, or 27.4 cents an hour. He charged that the employees were suffering under "gross inequities" caused by their wage rates lagging "materially behind the trend of employees generally in the United States."

Mr. Miller also argued that the board had ample power, under the stabilization regulations, to recommend adjustment of wages to

correct these inequities and to make up for deficiencies in railway wages in comparison with changes in the cost of living.

At the session on April 6, Mr. Miller turned to arguments in behalf of the employees' rules demands, charging that railroad management had met the employees' proposals for improvements in working conditions with 29 rules proposals that, if they were adopted "would send the laboring man back into railroad history of the early 1900's." He termed the carried rules proposals "decoys to be shot at or traded" and declared that they had been advanced to retard or to confuse the board." If these rules or any part of them were imposed upon any railroad, it would immediately cause widespread strikes," he prophesied, adding: "Resentment and unrest are already there."

"Inequity" Argument "Absurd"—Upon the conclusion of Mr. Miller's argument, J. F. Johnston, attorney, began the closing arguments in behalf of the carriers. Confining his remarks to the board's responsibility under the stabilization act, and declaring that it was absurd to grant wage increases based on "gross inequity" to a group of employees which he said "now enjoys and they have enjoyed for many years greater weekly and annual earnings than almost any other group of wage earners in the country." Mr. Johnston said that the stabilization act did permit cost-of-living wage adjustments, which in this case, would be 14.7 cents an hour, arrived at by multiplying the average basic rate of 90 cents in existence in January, 1941, by 1.33, the amount of the permissible cost-of-living adjustment, which he said amounts to 119.7 cents. Against that he balanced the average straight-time rate for October, 1945, less the 5 cents awarded by the late President Roosevelt in 1943 in lieu of overtime and as compensation for away-from-home expense, or a net October rate of 105 cents an hour.

However, he said, the arbitration boards, in their awards, had already set a pattern for the industry of 16 cents an hour which was obviously sufficient to take care of the cost-of-living adjustment. Any finding in excess of that amount by this board, he said, "would, in effect constitute a review of one agency established under the Railway Labor Act by another," would create "a bedlam of confusion in the industry," and would "be construed by the public, the industry and the great majority of the employees, not only as an unjust discrimination in favor of the highest paid employees in the industry, but as a reward to the small minority of employees who failed and refused to joined their brothers in the arbitration of their identical disputes."

Edwin E. Lucas, attorney, continued the argument for the carriers, discussing other factors of the wage case. Howard Neitzert, attorney, concluded the carriers' final arguments with a discussion of the rules proposals of both the unions and the railroads. He told the board that the strikes threatened by officials of the labor organizations in the event the carriers' rules proposals were made effective had no bearing on the merits of those proposals and should be disregarded by the board. Also, he denied that the carriers' rules proposals were the results of hasty action, saying that they had been initiated in 1941 and further that such action on the part of the railways was in line with a suggestion of the 1938 emergency board.

Determined to Clean Up Rules—Mr. Neitzert declared, "the carriers are determined to clean up these schedules and these schedule rules. We have embarked upon an undertaking that we shall pursue until its object has been accomplished. When we have secured the rules changes which we have requested and which are pending before this board, I hope and I believe that the carriers will request such further changes in the rules as may be necessary to eliminate, quoting the language of the 1938 board, 'regulations prevalent in the operating service that call for pay not commensurate with the amount of additional benefit rendered.' I hope and I believe that the carriers will continue their efforts in that direction until our industry, our managements and our employees stand free of the criticism that we are now obliged to endure under these rules."

Mr. Neitzert declared that the rules which the employees stated were built up to protect the men from abuses, had, in effect, been used to abuse, and he charged that the major object of the unions was to secure more pay for less work. He termed the union proposals "inequitable, uneconomic, unfair and antisocial," and characterized them as being of two classes, first, those proposed "hurriedly and recklessly" to defeat the carriers' proposals and, second, those pay rules which were carefully written as a means of circumventing the stabilization act and obtaining, by subterfuge, a wage increase. He also held that should the board recommend the maximum wage increase permitted by wage stabilization standards, viz., 16 cents an hour, it could not at the same time call for any reduction in the number of hours worked per month or per week without a proportionate reduction in pay, without violation of the stabilization law.

Mr. Neitzert charged that the employees had so rushed the rules case through that no one had had opportunity to present sufficient evidence on which the board could make an intelligent recommendation, and had done everything in their power to keep the board from learning the facts in a case involving $1.5 billion a year.

Employees' Rebuttal—The proceedings were completed by rebuttal argument in behalf of the employees by Mr. Miller, who confined his arguments to the relationship of the stabilization act to the proposed wage increases and rules changes. He argued that the 16 cent award of the arbitration boards did not constitute a part of a general pattern of wage adjustments in the railway industry since it was made subsequent to February 14, 1946, which he said was the time limit under executive order 9697 interpreting that act, and that consequently no general pattern existed and the board was free to set its own pattern, to include among other things the correction of "gross inequities," as well as to changes in the cost of living.

Mr. Miller asserted that, with respect to wage increases, the organizations would accept a wage adjustment calling for an increase in basic wage rates varying from 18½ per cent to 25 per cent, with a minimum of not less than 16 cents an hour, that minimum to increase as the percentage increases. He further demanded that the adjustment be made retroactive to August 1, 1945. In explaining the unions' position he said that it was their desire that "the award in this case should be made on a percentage increase based upon the basic rates of pay as of today, with a minimum for the lowest paid men, in keeping with the offer made by the carriers."

In accordance with the usual procedure, the board directed the disputants to appear before it separately and in a joint session, all to be closed to the public, in a final effort to mediate the dispute. These meetings were held on April 9, without affecting a settlement.

Material Shortages Delay Deliveries of Cars

The rehabilitation program of the railroads is being seriously retarded by the shortage of steel and the channeling of most lumber into housing construction, Stephen Early, vice-president of Pullman, Inc., told a group of 600 Twin City business men at a luncheon in Minneapolis, Minn., on April 10. He disclosed the fact that while the roads have placed orders for thousands of new passenger and freight cars, difficulties in securing parts to build them are holding deliveries to a minimum.

"We have almost reached a crisis in the movement of certain types of freight," he declared. "Thousands of freight cars used up by long and strenuous years of wear and tear during the war are urgently in need of repairs or replacement. In seeking materials to accomplish rehabilitation, the railroad industry finds itself in a highly competitive market. Materials are being directed into other channels and, to add to the difficulty, strikes in plants of suppliers are holding up parts that were actually scheduled for delivery months ago."

Somewhat similar conditions prevail in the passenger field, according to Mr. Early, who stated that thousands of modern cars must be built before the railroads' needs can be filled.

"While Pullman-Standard is well along in deliveries of its first orders for postwar passsenger cars, their early appearance in sizable numbers may be delayed beyond original completion schedules," he said. "The variety and volume of materials required in passenger car construction makes large stock-piles essential, and, until supplies are assured in a steady flow, it will be impossible to reach full output capacity. This may take months."

Mr. Early said that this situation "is just a case of another emergency for the railroads, and their ability to do the impossible is best evidenced when the going is toughest. That also holds true of their ability to meet the competitive threats from other forms of transportation. In the future, as in the past, the railroads will handle the lion's share of the traffic."

Merger of Two Budd Companies Proposed to Shareholders

Merger of the Edward G. Budd Manufacturing Company and the Budd Wheel Company, the surviving concern to be known as the Budd Company, was proposed on April 6 to shareholders by Edward G. Budd, president of the two companies. Shareholders will pass upon the proposal at meetings to be held in Philadelphia, Pa., on June 11. The unification, Mr. Budd

said, "has long been contemplated in the interest of unified direction, diversification of products and more efficient operation."

The Budd Manufacturing Company, with plants in Philadelphia and Detroit, Mich., manufactures bodies for automobiles, trucks and highway trailers, and railroad passenger cars of all types. The principal products of the Budd Wheel Company plants in Detroit are wheels, hubs and drums for passenger cars, buses and trucks; brakes for automobiles and railway cars; agricultural implements, and equipment for heating metals by electrical induction for forging and heat-treating. It also accepts contracts for heat-treating in its own shops.

Mr. Budd, in proposing the merger, emphasized that unification would permit work of one organization to "effectively supplement the other, to the great advantage of the combined company." He said the merger also would allow the unified company, operating on a broader base, to be less affected by market fluctuations, permitting a more consistent volume of production throughout the year. Certain economies also will result from unification of plant supervision and simplification of organization.

In asking shareholders to approve the merger, Mr. Budd said he anticipated the manufacturing company's volume of business would be three times its best pre-war volume, at least until the initial post-war demand is satisfied, as soon as the expansion program is completed and the adverse effect of the work stoppages of the early months of 1946 has been overcome. "Immediate orders for automobile bodies are much greater than in any pre-war year and demand for new cars is enormous. Several years of capacity production will be necessary to restore the normal balance of supply and consumption." The prospect in railway car manufacturing, the company's other major activity, is "equally gratifying," he added. Present unfilled orders are for about 600 cars, of which many are for Budd's modern sleeping cars. Prospects of Budd Wheel Company indicate an annual sales volume three times that of its best pre-war year since 1929. Reconversion and expansion of its plant is well advanced. Reconversion of the manufacturing company's plant was completed in 1945.

Club Meetings

The Northwest Locomotive Association will meet April 15, at 8 p. m. in Woodruff Hall, St. Paul, Minn. S. A. Stiglich, district service engineer for Electro-Motive Division, General Motors Corporation, will present a paper on "Servicing of Hyatt Journal Bearings on Electro-Motive Diesel-Electric Locomotives."

On April 15 at 6 p. m. the Western Railway Club will meet at the Sherman hotel in Chicago. A paper entitled "Railway Supply and Equipment Outlook" will be presented by C. D. Young, vice president of the Pennsylvania.

The Car Department Association of St. Louis will meet at the DeSoto hotel in that city on April 16 at 8 p. m. The program will include a paper on "Some Important Factors in the Safe Operation of Trains" by Interstate Commerce Commissioner W. J. Patterson, and a talk by C. M. House, superintendent of motive power and equipment of the Alton.

The New England Railroad Club has scheduled a meeting to be held on May 14 at the Vendome hotel, Boston, Mass., at 6:30 p. m. J. E. Slater, executive vice-president of American Export Lines, Inc., and chairman of the board of American Overseas Airlines, Inc., will present a paper entitled "Relationship of Air and Surface Transportation."

William Wyer, chief executive officer of the Central of New Jersey, will be the speaker at the next meeting of the New York Railroad Club, to be held April 18 at the Engineering Societies Auditorium, 33 West Thirty-ninth street, New York. Mr. Wyer's subject will be "Profit Sharing and Other Potentials in the Railroad Industry."

Lea Questionnaire Draws More Replies

(*Continued from page 775*)

equipment, the report added that, fortunately, most of them came out of the war in improved financial condition, "thereby affording opportunity for the needed modernization of their facilities and service. That they *should* take full advantage of that opportunity is obvious; that they *will* do so is a responsibility resting on management which it can confidently be expected to meet; but that they be *kept* in a sound financial condition is a responsibility not only of management but especially of the governmental authorities if users of transportation are to receive the best service possible."

While the statement of the national transportation policy contained in the Transportation Act of 1940 "could perhaps have been so interpreted and applied as to produce adequate results," its strengthening and broadening are called for, in the opinion of the committee preparing the report, because "there have been such important failures on the part of various governmental authorities to accept and effectuate its apparent intentions."

Fair Financial Treatment—While endorsing the elements of the policy "heartily, so far as they go," the committee remarks that a "striking impression is created by the absence of a more definite enunciation of the principle that regulated carriers rendering service to the public are entitled to conditions which will make compensatory earnings possible insofar as they are affected by regulatory or other actions of government. The statement is explicit with respect to the protection of all other interests, but indirect and vague with regard to this vital question of fair financial treatment."

Discussing this matter at considerable length, the report goes on to say that while section 15a of the Interstate Commerce Act requires the Interstate Commerce Commission to allow "sufficient" revenues for the carriers to provide the service the public is entitled to, "there seems to be good reason to doubt whether" that principle "has been wholly observed by that agency." The record of the years immediately prior to the recent war, it declares, "shows that the financial condition of the various carriers has been far from satisfactory from the long-range viewpoint of their ability to carry out the purposes of the National Transportation Policy. . . .

"Naturally, in considering this problem, attention is first directed to the railroads as the major carriers which furnish the main pattern for the country's transportation and thus vitally affect the service of other types of carriers. The long-range situation of the rail carriers is at present obscured by abnormal war-time earnings, but it seems probable that traffic and earnings will in the near future return to levels more comparable to the average of those which existed in the several years preceding our entry into the war. It is that prospect which should be taken into account in considering the question of national policy toward, and the needs of, these carriers."

Railroad Credit Position—While the "rule of rate-making" set forth by Congress in section 15a should have served as an adequate expression of policy, so far as compensatory rates are concerned, "in the period following 1933 the action or non-action of public authorities in certain respects resulted in failure to effectuate that policy," the committee declared. "Delays in enactment and effectuation of further needed regulatory legislation (particularly the Motor Carrier Act), together with I. C. C. decisions in general rate cases, findings of emergency boards in wage disputes and adverse activities of other branches of the government (notably the Department of Agriculture, the Department of Justice and the Bureau of Internal Revenue) contributed to the unsatisfactory revenue and credit position of the railroads prior to World War II, thus tending to impair their transportation service to the public."

Asserting that a National Transportation Policy should be "truly 'national' in breadth, scope and application," the report remarks that, in addition to strengthening the statement of policy with a view to "more realistic" application by the commission in considering the needs of carriers for revenues sufficient to maintain sound credit, "the question arises as to whether the policy should not extend (1) to actions of other governmental agencies besides those charged with the administration and enforcement of the Interstate Commerce Act and (2) to forms of transportation other than those specifically dealt with in that act."

This question is raised, the committee explains, for two reasons: "First, various governmental agencies, such as those charged with the administration and enforcement of the Anti-trust act, the Railway Labor Act, the revenue acts, the rivers and harbors acts, and the Merchant Marine Act, have in applying those statutes apparently felt justified in disregarding the policy statement or at least in failing to give it the controlling significance called for by Supreme Court rulings. . . . There appears to be no good reason for confining the declaration of a National Transportation Policy to matters dealt with exclusively under the Interstate Commerce Act; the full effectuation of that policy requires consistency in legislation and in its administration by all governmental agencies involved.

Policy Statement Limited—"Second, the policy statement . . . is by its terms limited in application to . . . rail, motor and water carriers, pipelines, and, since 1942, freight forwarders. Domestic and international air transport is separately regulated

under the Civil Aeronautics Act of 1938 and is subject to a somewhat different policy laid down in that act. International sea transportation is dealt with in the Merchant Marine Act of 1936, which likewise contains a different policy statement applicable to shipping in international commerce. We see no sound reason for these differences."

Turning then to the "proper implementation" of the stated policy, the report points out that the Chamber of Commerce "has long held as a basic principle that ultimately all competing forms of interstate transportation for hire should be regulated by a single federal agency," although it goes on to recommend that, "for a further reasonably limited development period," air transport be under separate regulation, and that a similar "temporary" exception be made with respect to ocean shipping.

The committee recommends that the I. C. C. should "use every effort within its legal authority to separate its judicial and administrative functions and delegate details to individual commissioners or staff, with a view to expediting decisions. We further recommend that through elimination of politics in appointments and reappointments, provision for retirement compensation and appropriate salaries effort be made to obtain commissioners of the highest possible qualifications." It suggests that "like policies" be applied to the Maritime Commission and Civil Aeronautics Board.

Rates and Mergers—Reiterating the organization's approval of the Bulwinkle bill to exempt carrier joint action for rate-making and similar purposes, under commission regulation, from the application of the anti-trust statutes, the committee urges that "only the broad principles to govern rate-making should be established by statute," leaving "full latitude" to the regulatory agencies to decide specific issues in the light of the "ever-changing requirements of the national economy." Differential rates, therefore, it suggests, should not be made mandatory, but should remain with the jurisdiction of the regulatory body. Further, it advises that, "to the extent that below-cost rates on competitive traffic or services are designed to injure competing carriers or stifle competition, or have that natural effect, their establishment and maintenance be prohibited as contrary to good business principles and the public interest."

Voluntary consolidation of railroads is still approved by the chamber, the report remarks, and it suggests that "railroad management should proceed with the development of plans for consolidation and business men lend full encouragement to such development." As to ownership or operation of one form of transportation by another, or the coordination of their operations, the body's position remains unchanged, that is, favorable, it went on to say. No departure from previously expressed views with respect to taxation of carriers and the "diversion" of special taxes levied on users of "public transportation facilities" is proposed. As to "government aid" to "new forms" of transportation, that is, "grants in the nature of subsidies and not general aids to commerce, such as channel markings and airway beacons," the committee holds this to be "sound principle, provided it is not applied to the serious disadvantage of other forms of transportation not receiving such aid." The 1944 and 1945 expressions of the organization deploring "state barriers" to interstate commerce are noted with approval.

Coming then to the question of cooperation between different forms of transportation, the committee suggests that "very large opportunities exist for improvement," both "in the sense of providing the public with transportation services utilizing the most suitable features of each form, and in the public relations sense, by which we refer to the attitudes and expressions of representatives of the different forms of transportation toward each other." Such improvements, it says, would not impair legitimate and active competition, but would intensify "beneficial competition."

Would Extend Shipper-Board Plan—Commenting on the success that has attended the functioning of the shippers advisory boards, the report suggests the need for similar organized relationships between shippers and other forms of transportation. Passage of the Bulwinkle bill, it adds, would permit direct cooperation in certain fields between carriers of different types, under commission regulation, and it expresses the opinion that it would be in the public interest to have "regularly established joint conference arrangements" between such carriers to the extent authorized by this legislation and for other matters "not involving competitive relationships." And "self-examination" by the respective carriers is recommended with respect to whether some forms of transportation are attempting to extend competitive efforts to hold or gain traffic so far as to have net detrimental effects upon their own revenues.

The committee sponsoring this Chamber of Commerce report is made up of Powell C. Groner, president of the Kansas City Public Service Company, chairman; Edward Clemens, executive vice-president of the Mississippi Valley Barge Line; Frank M. Evans, president of the Thomas Fruit Company; Edward P. Farley, chairman of the board, American-Hawaiian Steamship Company; Jack Frey, president of Transcontinental and Western Air; Hubert B. Fuller, attorney; Fred G. Gurley, president of the Atchison, Topeka & Santa Fe; W. Homer Hartz, president of Morden Frog & Crossing Works; L. O. Head, president, Railway Express Agency; William C. Henry, president, Northern Ohio Telephone Company; Arthur M. Hill, president, Atlantic Greyhound Corporation; Frank W. Hulse, president, Southern Airways; R. R. Luddecke, director of traffic, Standard Brands; Keith S. McHugh, vice-president, American Telephone & Telegraph Company; Gustav Metzman, president of the New York Central; J. W. Miller, president of Mid-Continent Airlines; Evans Nash, president, Yellow Transit Company; John E. O'Neill, vice-president, Producers Cotton Oil Company; Lewis Parmelee, executive vice-president, Atlantic Gulf & West Indies Steamship Lines; D. L. Sutherland, president of Middle Atlantic Transportation Company; Clewell Sykes, president, Yellow Cab Company (Philadelphia); A. W. Vogtle, vice-president, DeBardeleben Coal Corporation; John L. Wilkinson, president, Carolina Transfer & Storage Company; and A. N. Williams, chairman of the board of the Western Union Telegraph Company.

Air Transport Association—Opposition to the proposed creation of a single agency to control and regulate all types of interstate transportation, air, rail, water, and motor, is expressed by the Air Transport Association in its reply to the "questionnaire" distributed by Chairman Lea of the House committee. The association also takes a "firm stand" against "integration" and for "independent operation and ownership of the different modes of transportation."

Among the views expressed in the reply, prepared under the supervision of Emory S. Land, its president, were the following: The Civil Aeronautics Administration and Board should be retained as a "separate regulatory and promotional body for air transport"; spread of "multiple state taxation" should be halted; interstate air lines should be made "clearly subject only to federal authority in both economic and safety matters"; "broader participation" in air transport by surface carriers should not be permitted.

The association does not think more "directives" from Congress necessary to provide "new money" for the industry's $750 million expansion program, but it favors continued "modest public assistance to an extent consistent with the public security and welfare." Air transport, it declares, "has not emerged from its experimental period. It has not acquired a financial and traffic position able to sustain unlimited burdens laid upon it. The air transport needs of the country justify a continuation of the fostering care of the nation."

Defends Subsidy—Remarking that all major forms of transport except pipelines have had "public assistance in their development," the association declares that the "modest" amount received by the "scheduled air transport industry" has produced large public benefits. The industry, it says, is "steadily moving in the direction of complete self-support. Little if any public assistance remains in the compensation for carrying the mails. Contracts for airport facilities furnished by municipalities indicate a similar trend. The federal airways pose a difficult problem of determining appropriate charges, which is receiving the attention of the Congress, the executive agencies of the government and the air lines."

"Integration" proposals, if carried into effect, says the association, "would result in transport monopoly and deprive the public of the benefits it has obtained from competition between the forms of transport. If the air lines are included in such projects, the development of the air transport industry will be retarded; it will have less freedom to adopt new organization methods and operating practices and will instead be pressed into a mold of surface carrier developments."

The views of the Federal Transportation Association, a group of traffic and transportation employees of 18 federal agencies, begin with the observation that the national transportation policy "expresses an ideal, not an accomplished fact." While it holds that "theoretically" a single regulatory agency would better promote an "integrated national transportation policy" than separate agencies, the association sees a danger that "monopoly, apathy or inefficient regulation" might result in stifling technological

advances, particularly in air transport and in the interchange of cargo from one type of carrier to another.

Favors One-Man Administration—Not a board or an agency, but a "strong, broad, impartial, forward-looking man" should direct the application of the national policy to the several carrier types, it says. Because "common carriers are still in position to injure the public through illegal joint action," their exemption from the anti-trust laws, so far as joint action in rate-making is concerned, is not approved. The federal government should not operate transportation for public hire "unless there is strong and unquestionable affirmative finding of public need," the association says. Rate differentials are "part and parcel" of the principle of private ownership, but the various forms of transportation must be forced, if necessary, to make joint rates and interchange arrangements with one another. Consolidations of carriers of the same type are accepted as having some advantages to the carriers, at least, but consolidations of carriers of different types are opposed. Such mergers "apparently would be dominated by railroad interests," and the performance of the rail carriers when they had little strong competition left "much to be desired from the standpoint of the public interest."

Continuing, the association recommends that the commodities clause should be extended to all forms of transportation, and should not only bar carriers from owning commodities they transport, but should bar producers of commodities from owning common carriers. The desirability of "federal aids" to transportation, it says, should be decided by the federal transportation administrator. Most "state barriers," it says, appear to be intended to benefit railway labor, and the federal government has a "public duty" to remove "most" of these barriers; federal highway aid should be used as a "lever" to obtain state compliance, whatever the extent of its constitutional authority.

Finally, says the association, the federal government's activities as a transportation customer "should be consistent with its activities as a regulator. Government routing policy should not be dictated entirely by economy, but must also consider other traffic advantages, as does the policy of business men generally, and should further the national transportation policy. Government procedures in buying and paying for transportation should parallel more closely the practices prevailing in commerce generally."

Welded Boilers Discussed at A.S.M.E. Spring Meeting

Locomotive boilers of welded construction was the subject of a paper presented by James Partington, manager, engineering department, American Locomotive Company, before the Railroad session of the American Society of Mechanical Engineers, during the Spring meeting of the society at the Read House, Chattanooga, Tenn., on April 2, 1946. The chairman for the meeting was C. E. Pond, assistant to superintendent motive power, Norfolk & Western.

Mr. Partington reviewed the history of welding in railroad shops and spoke of the good and poor welding done during the early days of welding. "These misapplications of welding," he said, "made it imperative that the Bureau of Locomotive Inspection, Interstate Commerce Commission, prohibit welding on locomotives except in the firebox and then only as high as 14 in. below the highest part of the crown sheet." After the welding rules approved by the A. S. M. E. Boiler Code Committee and by the society in 1925 were used Mr. Partington said very definite improvements were made in welded construction. He reviewed briefly the construction of the first all-welded boiler for the Delaware & Hudson and in reference to that boiler stated "The welded joints have developed no leaks and no repairs on the shell of this boiler have been necessary in over eight years of service."

Mr. Partington referred to the primary function of the boiler as a pressure vessel but also pointed out that it acts as a beam because it is the "principal stiffening element in a long structure which is supported on springs and is subject to many vibrational shocks." Comparing the barrel portion of the riveted with the welded boiler construction he said, "This barrel or circular portion in a riveted boiler usually consists of two or three separate courses riveted together with double riveted seams having an efficiency factor of about 65 per cent.

"Considered as a beam, this interrupted continuity of section is an element of weakness because of the reduction in strength at the circular seam and the offset from a straight line at these lapped seams. These offsets are focal points for concentration of stresses which, in combination with other causes such as caustic embrittlement, produce progressive fractures generally in the form of cracks at or near these lapped seams.

"The circular seams of welded boilers are double welded butt joints which under test show 100 per cent efficiency and, of more importance, considered as a beam the continuity of the structure is maintained."

In conclusion Mr. Partington said, "With the ending of the war, a number of orders have been placed for welded locomotive boilers and additional orders are pending. When these boilers are ordered in sufficiently large quantities to justify the maximum employment of positioning devices and the maximum use of machine welding, the cost of these superior boilers will be reduced to a point where it will compare favorably with the cost of riveted boilers. The use of welded locomotive boilers will greatly reduce the charge for boiler maintenance in railroad shops and also greatly reduce the time locomotives are out of service on account of boiler repairs."

Following the presentation of Mr. Partington's paper, a factual account of the performance of the first all-welded boiler on the Delaware & Hudson, prepared by George S. Edmonds, superintendent motive power, Delaware & Hudson, was read by I. N. Moseley, general boilermaker, Norfolk & Western.

Discussions of Mr. Partington's paper, written or oral, were made by A. J. Moses, vice president and general manager, Hodges-Walsh-Werdner division, Combustion Engineering Company, Inc.; John M. Hall, director, Bureau of Locomotive Inspection, Interstate Commerce Commission; J. G. Adair, mechanical engineer, Bureau of Locomotive Inspection, Interstate Commerce Commission; A. J. Townsend, vice president, Lima Locomotive Works, Inc.; Ralph Johnson, chief engineer, Baldwin Locomotive Works; J. D. Loftis, general superintendent motive power, Atlantic Coast Line; A. F. Stiglmeier, general supervisor boilers and welding, New York Central; H. B. Oatley, vice president, Superheater Company; W. M. Barr, research and standards consultant, Union Pacific; H. L. Miller, metallurgist, Republic Steel Corporation; and F. P. Huston, development and research division, International Nickel Company.

Freight Car Loadings

Loadings of revenue freight for the week ended April 6 totaled 644,663 cars, reflecting the coal mine shutdown caused by strikes, the Association of American Railroads announced April 11. This was a decrease of 164,479 cars, or 20.3 per cent, below the preceding week; a decrease of 121,009 cars, or 15.8 per cent, below the corresponding week last year, and a decrease of 143,322 cars, or 18.2 per cent, below the comparable 1944 week.

Loading of revenue freight for the week ended March 30 totaled 809,142 cars, and the summary for that week as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, March 30, 1946			
District	1946	1945	1944
Eastern	165,882	167,641	159,883
Allegheny	182,868	189,834	178,709
Pocahontas	59,645	55,065	53,734
Southern	136,762	133,025	118,851
Northwestern	83,477	89,754	86,810
Central Western	117,738	126,394	117,729
Southwestern	62,770	74,287	70,390
Total Western Districts	263,985	290,435	274,929
Total All Roads	809,142	836,000	786,106
Commodities:			
Grain and grain products	42,631	46,560	41,327
Livestock	15,854	14,521	14,473
Coal	186,237	171,675	164,337
Coke	13,182	15,639	14,797
Forest products	39,508	41,774	40,992
Ore	9,748	22,201	17,444
Merchandise l.c.l.	128,742	112,422	109,013
Miscellaneous	373,280	411,208	383,723
March 30	809,142	836,000	786,106
March 23	804,606	816,741	777,578
March 16	799,882	816,556	785,195
March 9	786,202	767,055	780,265
March 2	782,397	785,736	786,893
Cumulative Total, 13 Weeks	9,732,559	10,078,230	10,228,853

In Canada.—Carloadings for the week ended March 30 totaled 69,480 cars, as compared with 71,104 for the previous week and 62,465 cars for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

Totals for Canada:	Total Cars Loaded	Total Cars Rec'd from Connections
March 30, 1946	69,480	37,455
March 31, 1945	62,465	40,322
Cumulative Totals for Canada:		
March 30, 1946	863,076	458,836
March 31, 1945	846,086	481,331

With the Government Agencies

Cost of Wage Raise Estimated by I.C.C.

On 1945 hours, increase would be $658 millions; pay is up 49% over 1939

Assuming that the increase in basic wages for the year 1946 received by railroad employees (except executives, general officers and assistants) as a result of the awards of arbitration and "emergency" boards will average 16 cents per hour, the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission has developed figures to show the cost to the Class I roads if the number of hours paid for in 1946, or any year subsequent to 1945, is the same as the total paid for in any year from 1939 to 1945, inclusive. The costs, as stated in the latest issue of the bureau's "Monthly Comment," are in addition to all wage increases granted prior to 1946.

The tabulation follows:

Year	Total hours paid for	Cost of wages increase based on 16¢ per hour for all time paid for	Cost shown in preceding column plus allowance for time paid for in excess of straight time rates
	Millions	*Millions*	*Millions*
1939	2,460	$394	$398
1940	2,587	414	419
1941	2,960	474	482
1942	3,409	545	557
1943	3,780	605	626
1944	3,960	634	659
1945	3,943	631	658

Rise in Hourly Earnings—Other calculations showing the effect of the wage increases indicate what the total compensation paid employees (other than executives) would have been for each year in the 1939-1946 period if all wage increases during the period had been retroactive to each of those years. Average straight time hourly earnings of all employees (except executives) increased from $0.721 in 1939 to $1.076 in 1946, this tabulation shows. Using the 1939 average as 100, the index of straight time hourly earnings for the succeeding years is shown as follows: 1940, 100.3; 1941, 104.3; 1942, 113.6; 1943, 121.8; 1944, 126.8; 1945, 27.1; and 1946, 149.2. The actual total compensation paid and the amount that would have been paid on the basis of 1946 hourly earnings, stated in millions, follows:

	Actual	Adjusted
1939	$1,795	$2,679
1940	1,895	2,820
1941	2,264	3,239
1942	2,853	3,748
1943	3,435	4,210
1944	3,762	4,429
1945	3,766	4,424

Another table in the "Comment" compares the actual operating revenues and expenses of the Class I roads for the same years with the differences between actual compensation paid and the "adjusted" compensation given above. The differences are stated on a percentage basis as follows:

	Amount (millions)	Per cent of op. revenues	Per cent of op. expenses
1939	$884	22.1	30.3
1940	925	21.5	29.9
1941	975	18.2	26.6
1942	895	12.0	19.5
1943	775	8.6	13.7
1944	667	7.1	10.6
1495	658	7.4	9.3

These figures indicate that in 1942, for example, the additional compensation represented by all wage increases (1939 through 1946) would have been $895 million. The "implication" is, then, that the wage increases would have been offset, in that year, if revenues had been 12 per cent greater than they actually were, while in prior and subsequent years correspondingly higher and lower increases in revenues would have been required to compensate the wage increases.

None of the figures dealing with wage increases take into account additional charges which the railroads would be required to meet in the form of payroll taxes for old age pension and unemployment insurance, the bureau points out, but on the other hand no estimate has been made, either, of the amount of federal income tax reductions that would result from the increased overall expenses.

Yield on Common Stock—Another section of the "Comment" discusses the yield on railroad common stocks (computed by dividing their prices into their dividend rates) since 1926. An accompanying chart shows that, under the influence of prosperous business conditions, the yields on rail stocks, as on industrials and utilities, declined from 1926 until the middle of 1929, when a sharp increase in yields, reflecting the crash of stock prices, followed to 1932. During this period the relative market ranking of railroad, industrial and utility stocks remained about the same.

After 1932, when there was another sharp price decline, there was a "drastic" change in the relative market estimates of these three types of enterprises in terms of yield, the "Comment" points out, and in 1932, 1933, and part of 1934 rail common stock yields were only a third to a half of the utility yields and were substantially lower than those of the industrials.

In contrast, although yields on common stocks of all three types of enterprises declined "decidedly" during the war period, the bureau goes on to say, "the market evaluation of the railroads during this period in terms of yields has been considerably less favorable than for industrials and utilities. Despite the large increases in rail traffic and earnings during the war, the rail common stock yield . . . has not fallen below 5 per cent since 1940 though the yield has declined as low as 3 per cent on industrial commons and substantially below 4 per cent for utility issues."

(Continued on page 787)

Opposition Mounts on Bulwinkle Bill

But Senate committee members show liking for it with some modifications

The Bulwinkle bill, H. R. 2536, was subjected to additional attacks this week as hearings on the measure, passage of which would exempt railroads from anti-trust legislation in respect to rate-making procedures, continued before the Senate interstate commerce committee. Testimony in opposition to the bill is expected to continue through April 19, during which period Wendell Berge, anti-trust chief of the Department of Justice, Commissioner Clyde B. Aitchison of the Interstate Commerce Commission and several Justice Department witnesses are expected to testify.

Highlight of this week's hearings was the appearance of Secretary of Commerce Wallace, with a 17-page prepared statement. With Senator Reed, Republican, of Kansas, on the firing line, Mr. Wallace declared that he did "not necessarily" agree with the Department of Justice that rate conferences are unlawful and that a violation of the anti-trust laws "depended upon the particular case."

Wallace Opposes Bill—"A number of rate bureau functions are valid and should be preserved," Mr. Wallace added, "providing the carriers can move without coercion. I am in favor of fair competition and in order to maintain that practice, there should be a uniformity of rates. However, such uniformity should not interfere with progress."

In reply to a remark by Senator Reed that "it is unfair to say that small shippers have suffered from rate-making procedures," Mr. Wallace declared that "under present conditions, the small shipper is not in a position to complain effectively." The Kansas senator agreed with the secretary that the present I. C. C. method of adjusting rates in formal complaint procedures is too expensive for the smaller carriers.

Mr. Wallace said that his "only suggestion" to correct the present conference Rate-making system was "to defeat the bill." He admitted he was not familiar with all aspects of the measure and rate-making procedures but insisted that enforcement of anti-trust legislation would "scuttle" the present set-up.

At the request of Senator Wheeler of Montana, committee chairman, Mr. Berge was called upon during Mr. Wallace's testimony to explain the Department of Justice's position in the current anti-trust suits filed against the railroads by the State of Georgia and by the department at Lincoln, Neb.

Berge Statement "Incoherent" — "Conferences to discuss rates are not considered illegal by the Department of Justice," Mr. Berge said. "But the Supreme Court says and we contend that private agreements to fix rates are illegal."

Senator Reed, declaring that "certain amendments" will be made to the bill before it is recommended for passage, said that Mr. Berge's statement was incoherent in that he could not see "when a conference stops being legal and becomes illegal." He added that shippers favored the bill because as members of rate-making conferences they otherwise also would be subject to anti-trust laws.

In his prepared statement, Mr. Wallace said that "passage of the bill will impose a tax on all industry and consumers for the benefit of those potential monopolists in the transportation industries who seek to escape the last legal deterrent to their conspiracies.

"In his budget message, President Truman proposed a coordinated anti-monopoly program. The Bulwinkle bill, which runs directly counter to this program, does not place any limitation upon the type of matter which carriers or forwarders could make the subject of private agreements with relief from the anti-trust laws.

Sees Competition Impaired — "The basic defect of the bill is that it grants broad immunity from the anti-trust laws to common carriers within each form of transportation and to freight forwarders, without establishing adequate safeguards against coercive and collusive practices by such carriers and forwarders that would impair competition in rates and services. With the fear of anti-trust law prosecution removed and no close surveillance by the I. C. C. provided, it could reasonably be anticipated that the coercive and suasive practices of the past would multiply and that competition in rates would be further curtailed.

"That the spur of competition is necessary to stimulate efficient operations, improved services and rates which more nearly reflect the costs of the most efficient carriers has been recognized by the shippers. Thus, the National Industrial Traffic League requested an amendment, which was inserted by the House committee on interstate and foreign commerce, to prohibit the commission from giving approval to agreements between carriers in different types of transportation, except with respect to joint rates and through routes which, of course, cannot be arranged without concurrences of the carriers directly involved in interline traffic.

"Although the I. C. C. has strong powers to assure an equitable distribution of cars to regulate service with respect to adequacy and safety," Mr. Wallace continued, "it does not have direct control of many other aspects of service of great interest to users. Even with respect to rates, where the I. C. C.'s powers are complete, regulation is an inadequate substitute for competition from a practical standpoint. In the absence of effective competition, the I. C. C. would have to depend upon the complaints of shippers and its own investigations to make sure that the thousands of freight rates under its jurisdiction were not at excessive levels. Commissioner Aitchison reported to the House committee that only about 40 per cent of the tariffs filed have been specifically checked as to reasonableness in the past and the standard of reasonableness in the Interstate Commerce Act has been demonstrated to involve a band or zone so broad between minimum and maximum rate possibilities as to be of little value to the small shipper, or to some large shippers, in the absence of competitive pressures.

Make Independent Action Easy— "We should free the forces of competition," declared the witness," by making independent action by competing carriers meaningful rather than to render taking such action more difficult through granting rate bureaus broad relief from the anti-trust laws. It cannot be reiterated too often that the exemption requested from the anti-trust laws is wanted not merely to enable carriers and shippers to discuss rate changes and to disseminate technical information but to authorize the making of specific agreements to restrict competition in rates and services.

"While H. R. 2536 would give the carriers broad relief from the anti-trust laws, it contains no teeth for protection of public interests against coercive practices and other restraints upon competition in rates and services. The proposed legislation would extend the domination of the small carriers by the larger ones, particularly in the trucking field, and if private enterprise in transport is to survive, it will be necessary to protect the right of newly-established carriers to compete, not to destroy it.

"To obtain the full measure of economy under our system of regulated private operation of transportation agencies, continued anti-trust law surveillance is necessary to maintain open competition in the area of initiation of rates and services where regulation is powerless to prevent carriers from adopting restrictive policies.

"The distributive services, including transportation, will find no difficulty in adjusting themselves to competition in a growing economy. The government's fight against monopoly is a fight for freedom and limitations on the effectiveness of that fight are in reality attacks upon our competitive free enterprise system and upon the rising future which that system implies."

Thurman Arnold — Another witness, Thurman W. Arnold, former assistant attorney-general in charge of anti-trust law prosecutions, declaring that he believes in the "maximum of competition," told the committee that if the bill is passed the Justice Department will be "stripped of its power" to prosecute carriers under the anti-trust laws. "This will mean that the lid will be off and that rate-making conspiracy will be validated by the I. C. C.," he added. He said that "fear of prosecution" is the only thing that will create competition in these "collusive agreements."

Senator Wheeler, who together with Senator Reed expressed the opinion that the bill could be amended to continue the railroads' conference rate-making method under I. C. C. regulation without "coercion," reminded the witness that "at present, the I. C. C. has no authority to regulate the rate bureaus."

"I still think it can be done through amendment of this legislation, if the I. C. C. does a job," the committee chairman said.

Don't Lead I. C. C. "Into Error"— Mr. Arnold declared that "when you allow railroads to make agreements, except on joint through rates, competition is destroyed. Coercion keeps this thing frozen," he continued. "The I. C. C. will say we are going to balance the lumber industry in Oregon and some other state. It is the National Recovery Act all over again. Let's not lead the I. C. C. into error by subjecting them to pressure by Association of American Railroads and other groups. I fear that this bill opens the door for industry after industry to come in and get exemption from the anti-trust laws and also opens the door to the beginning of a cartel system.

"Judge Fletcher, vice-president of the A. A. R., is concerned that if you change rates, you will have unstabilization," Mr. Arnold added. "The railroad business should be competitive. Railroads have lost their monopoly. They can compete with planes."

Mr. Arnold concluded that the 1916 Shipping Act, which permits shipping lines in foreign trade to enter into conferences, has been used as a precedent for the Bulwinkle bill and that the measure would be a "tremendous wedge for an integrated transportation system." Senator Reed interposed that many people in the government have been urging an integrated transportation system upon Congress.

Congresswoman Helen D. Mankin of Georgia charged that passage of the measure would place in the hands of a "tired" commission the duty of protecting the public from the evils of "a monopolistic railroad group headed by the A. A. R."

Commission Not Energetic — She said the Bulwinkle bill was the main reason she "ran" for Congress and that she aims to do everything in her power to defeat it. She traced the attempts of the South to procure rail freight rate "parity" with the East, and declared that the "commission has become so involved in red tape that it is no longer capable of serving the function of an energetic militant enforcement agency which would be required if the transportation industry were relieved from the operation of the anti-trust laws."

Walter E. Meyer, New York attorney, who also opposed the bill, said that the I. C. C. did nothing to protect the St. Louis Southwestern, of which he is a director, from being "destroyed" by anti-trust law violations of bigger railroads. He asserted that at one time the I. C. C. dropped anti-trust proceedings against the Kansas City Southern and that 11 years later he discovered that the commission had proof in its files during that period that the line had violated the anti-trust laws. He also charged the Southern Pacific with taking freight from the St. Louis Southwestern and giving it to other roads willing to pay "excessive car rentals" levied by Pacific Fruit Express, of which the Southern Pacific owns 50 per cent. Senator Reed, incidentally, found Mr. Meyer's testimony "irrelevant" to the Bulwinkle bill and walked out.

Other testimony in opposition to the bill was presented on April 4 and 5, following the three-day appearance of Governor Arnall of Georgia, reported in *Railway Age* of April 6, page 739.

Would Await Court Rulings—Arne C. Wiprud, former chief of the transportation section of the anti-trust division of the Department of Justice, suggested that the

committee recess its hearings on the measure until the "area of permissive collaboration" in railroad rate-making has been defined by the Supreme Court.

Mr. Wiprud, whose investigations were instrumental in the Justice Department's anti-trust proceedings against the western railroads, testified that passage of the bill would automatically dismiss Georgia's suit in the Supreme Court and the case in Lincoln, Neb., an opinion also expressed by Governor Arnall. Senator Wheeler said he understood Attorney General Clark had reached the same conclusion.

The witness also agreed with Governor Arnall in recommending dissolution of the A. A. R., but this statement met with vigorous disapproval from Senator Hawkes, Republican, of New Jersey. "Why would you dissolve the A. A. R. any more than you would dissolve the C. I. O., the A. F. of L. or any other labor organization, the National Association of Manufacturers or any other over-all organization?" he inquired.

"Because the over-all conspiracy of the eastern bankers to prevent competition among the railroads is carried on by the A. A. R.," Mr. Wiprud replied. "Furthermore, it assumes economic power greater than that of the government itself."

"I don't think there is any industry that has some power that you wouldn't thing is coercive," Senator Hawkes countered. "We have got to know our facts before we do something to disrupt the A. A. R.," he continued, adding that he opposed "monopoly that strangles the people." He said, however, that he did not believe in "singling out" one particular organization, such as the A. A. R.

"Greatest Monopoly"—"The facts will reveal that this is the greatest monopoly ever perpetrated," Mr. Wiprud insisted. "With the decision of the Supreme Court in the Georgia case, we can look forward for the first time to an authoritative definition of 'coercion' in the field of rate-making." He called the committee's attention to an "attempt" of the Interstate Commerce Commission to define "coercion" under the certificate promulgated by the War Production Board, which legalized private conference rate-making for the war's duration.

"The I. C. C. provided in its regulations," he added, "that no boycott, or other means of intimidation shall be employed by a rate conference, directly or indirectly, to restrain a carrier, either a member or non-member, from taking independent action, consistent with these rules, to establish rates other than those approved at a rate conference."

In reply to Senator Wheeler, Mr. Wiprud told the committee that the I. C. C. reviews only one per cent of the rates fixed by railroads through the conference method, although several members of the committee challenged him relative to commission procedure. "Rates are filed with the I. C. C. and if no complaints are made, the tariff becomes effective in 30 days," Mr. Wiprud said. "The one per cent of rates reveiwed by the I. C. C. represents suspensions resulting from complaints. The only way to determine reasonableness of rates is by holding hearings."

I. C. C. Rate Procedures—"If the commission doesn't review the reasonableness of rates, it is not doing its duty," Senator Wheeler remarked. "Thousands of rates are filed and while the I. C. C. wouldn't have hearings on all of them, I understand they are reviewed. That's what the commission was created for."

The witness pointed out that the law provides that the commission shall fix "just and reasonable rates," to which the chairman added that if the commission is not following this practice, "it is not complying with the law." It was explained at this point by Examiner Hosmer of the I. C. C. that the commission's tariff divisions reviews rate applications to determine whether they are in "proper order," but that no actual review of the rate is made unless complaints are filed.

Another witness, J. C. Winter, chief of the transportation facilities division, Department of Agriculture, told the committee that the bill, as it now stands, is "too broad." He said that with adoption of "certain proposed amendments," which would protect shipping interests, the department would recommend its passage. He contended that the kind of agreements that may be approved by the commission should be mentioned specifically in the bill. He added that they should be restricted to agreements pertaining to rates, charges, classifications, routes and tariffs.

"We consider these proposed additions or limitations so essential to the protection of the public that in the event they should not be adopted, we would recommend that the bill be defeated," he continue. "It should do nothing more than legalize the legitimate functions of the rate-making bureaus when their procedures and such agreements as properly may be entered into by them have been approved by the I. C. C."

C. E. Childe, "consultant" of the Senate small business committee, testified that the Bulwinkle measure "fails to set up adequate safeguards against coercive and collusive practices, which everyone agrees is a matter of the highest importance if carriers are to be relieved from liability under the anti-trust laws."

"The only definite requirements of the bill are that the individual carriers be given opportunity to act contrary to group decisions; that carriers of different classes shall not agree on matters not pertaining to joint transportation and that the I. C. C. shall find that agreements are in furtherance of the national transportation policy."

Mr. Childe does not believe there is any necessity or reason for relieving carriers from liability under anti-trust laws for reaching agreements which amount to collusion or conspiracy in restraint of competition, or which prevent reduction in rates or improvements in services by individual carriers. "Such collusive or coercive group action can result and has resulted in the past in the maintenance of discriminatory service and rates," he continued, "and has sometimes contributed to inefficient wasteful transportation against the public interest."

More Air Mail Proposals

Carrying out further the suggestions toward expansion of the domestic air mail service contained in the recent study of that question which was the subject of a report by Gael Sullivan, second assistant postmaster general (reported in *Railway Age* of March 23, page 651), Representative Boren, Democrat of Oklahoma, has introduced two bills (in addition to one already noted in *Railway Age* of April 6, page 741) and Representative O'Brien, Democrat of Michigan, one, to extend the air mail service.

The Boren bills are H. R. 6028, which would authorize the establishment of air mail service for non-first class mail, including parcel post, on a basis to "assure the receipt of revenue from such service adequate to pay the cost thereof," and H. R. 6029, which would authorize the postmaster general to lease space at public airports for use in handling mail.

The O'Brien bill, H. R. 5993, would create a 5-man aeronautical advisory committee; fix the air postage rate on first class mail at 5 cents per ounce; establish air parcel post rates on a zone system (ranging from 45 cents plus 3 cents per pound in the first zone to 67 cents plus 53 cents per pound in the eighth zone, with a 10-lb. weight limit); authorize the lease of mail handling space at airports; and provide for an assistant secretary of state for air in the State department.

New Administrative Procedures Bill Offered

Representative Walter, Democrat of Pennsylvania, has introduced a bill (H. R. 5988) "to improve the administration of justice by prescribing fair administrative procedure," which is similar to the bill (S. 7) passed by the Senate, with modifications favored by members of the House judiciary committee. As noted in *Railway Age* of July 7, 1945, page 46, the Interstate Commerce Commission opposed the application of the administrative procedure bills to it in the form in which they were originally drafted.

Backlog of Equipment Orders at Year's End

Statistics, showing the value of December, 1945, shipments of rail transportation equipment, as compared to November, 1945, and the monthly 1944 average, and unfilled orders as of December 31, 1945, as compared to November 30, 1945, and December 31, 1944, were released last week by the Department of Commerce.

Shipment of locomotives and parts totaled $29,277,000, a decrease of 17.9 per cent under November, 1945, and 19.7 per cent under the 1944 monthly average. Diesel and electric locomotives were valued at $6,252,000, a decrease of 48.5 per cent and 39.4 per cent, respectively. The valuation of steam locomotives, $16,744,000, showed a decrease of 9.0 and 20.3 per cent. Increases are noted in locomotive parts, valued at $6,281,000, at percentages of 22.9 and 19.0, respectively.

Shipments of railroad cars amounted to $13,517,000, a 30.1 per cent increase over last November, but a 22.6 per cent decrease from the monthly 1944 average. Railroad car parts, valued at $9,354,000, and railroad frogs, switches and crossings valued at $1,532,000 were shipped in December. Increases of 45.3 per cent and 30.8 per cent

were noted in the December shipments of railroad signals and related accessories, which totaled $2,939,000.

Unfilled orders of locomotives and parts at the end of December amounted to approximately $308,000,000, an increase of 6.9 per cent over last November and 1.8 per cent increase over December, 1944. The estimated value of Diesel and electric locomotives on order was $152,358,000; of steam locomotives $136,490,000. Locomotive parts on order were estimated at $19,000,000.

Unfilled orders of railroad cars as of last December totaled $308,668,000, an increase of 16.0 per cent and 32.4 per cent, respectively, while railroad car parts on order were valued at $86,042,000, increases of 1.5 per cent and 90.3 per cent, respectively.

Frogs, switches and crossings on order amounted to $15,418,000, and unfilled orders for signals and related accessories totaled $15,717,000.

F. P. C. Gets Second Application for Gas Pipeline

The Big Inch Gas, Inc., has applied to the Federal Power Commission for authority to construct the necessary conversion facilities and to operate the so-called Big Inch pipeline from Texas to New Jersey to transport natural gas from eastern Texas to markets in New York, New Jersey and eastern Pennsylvania. An application of the Trans-Continental Gas Pipe Line Co. for authority to convert both the Big Inch and the Little Big Inch to the transportation of natural gas was reported in *Railway Age*, March 30, page 697.

Big Inch Gas informed the commission that its offer to the War Assets Corporation of $40,000,000, for the Big Inch is made in conjunction with an offer of Big Inch Oil, Inc., to purchase the Little Big Inch for transportation of petroleum products. The applicant proposed to begin the necessary conversion immediately upon acquisition of the pipeline. The cost of construction is estimated at $30 million.

According to the application, the line would be put into operation with a capacity of about 275,000,000 cubic feet of gas daily. The applicant said it already has developed a market for about 90 per cent of its gas load with utility companies in New York and New Jersey, and that it has commitments for the purchase of 300,000,000 cubic feet of gas per day from producing areas in eastern Texas.

Extends Reply Date in I. C. C. Truck-Forwarder Study

Secretary W. P. Bartel announced this week that the Interstate Commerce Commission has extended to May 15 the time within which interested parties may file with the commission memoranda or briefs containing their views as to the interpretation that should be placed on any of the provisions of section 409 of part IV of the Interstate Commerce Act, as amended, along with suggestions as to conditions that should be prescribed and regulations that should be made by the commission to carry out its purposes.

As reported in *Railway Age* of March 16, page 584, the commission has instituted an investigation on its own motion, docketed as No. 29493, to "determine and prescribe reasonable, just and equitable terms and conditions under which agreements may be made for the utilization by freight forwarders of the services and instrumentalities of common carriers by motor vehicle."

Rail Equipment Price Control Suspended by O. P. A.

Locomotives and tenders, passenger and freight cars and many other types of railroad parts and specialties are included in the transportation equipment on which price control has been suspended, it was announced in Washington, D. C., on April 8 by Paul A. Porter, Price Administrator. This action, he said, carries out our "policy of removing price controls as soon as they are no longer needed to safeguard the country from the disaster of inflation.

"The results of this suspension—price ceilings are only being suspended and not removed—will be under constant scrutiny, partly by means of O. P. A. surveys, and the ability of the industries involved to price their products at reasonable levels will influence the O. P. A.'s future decontrol policy," he added.

"Adequate" Block System Again Recommended by I. C. C.

A recommendation that the Illinois Terminal install an "adequate block system" on the line on which a side collision occurred February 21, at Lead Works, near Alton, Ill., was made by the Interstate Commerce Commission in its report of an investigation under the supervision of Commissioner Patterson.

The accident involved a freight, Extra 34 North, made up of a steam locomotive, 70 cars and caboose, and a southbound passenger train, No. 47, a single electric traction car. It occurred at the south switch of a lead track located 5.2 miles south of Alton, on the line to St. Louis, Mo., where trains are operated on the tangent single-track line by timetable and train orders. No block system was in use, although a continuously-lighted, two-indication, color-light type open-switch protection signal, located at a point 2,567 ft. north of the switch, was arranged to indicate red (stop, then proceed at restricted speed) when the switch was lined for movement to the lead track.

No maximum speed was specified by rule for this vicinity, the report explained, but the maximum speed attainable by the electric traction cars is 40 m.p.h. The average daily movement in the 32 days preceding the collision was 41.22 trains.

The accident occurred about 10:35 p. m. in clear weather. No. 47 approached Lead Works at about 35 m.p.h., and the motorman said he observed the open-switch signal displaying green (proceed) when it was some distance ahead, but did not again notice the indication. When the car was about 300 ft. north of the fouling point of the switch he saw freight cars on the turnout and applied the brakes in emergency, reducing the speed to about 10 m.p.h. when the passenger car struck the side of the fifty-fifth car of the freight. The front trucks of both cars were derailed and the traction car was badly damaged.

The northbound freight had stopped on the main track, with the engine in the vicinity of the switch, about 10:27 p. m. The front brakeman said he placed a lighted 5-minute fusee on the main track immediately north of the switch and then lined the switch for his train to enter the lead track. Its movement was somewhat delayed because a cut of cars occupied the track into which it was moving, and when it resumed motion at about 5 m.p.h. the front brakeman went ahead of the cut of cars to watch for other cars on the track. The conductor and flagman remained in the caboose. About 8 minutes after the freight had stopped at the switch, its fifty-fifth car was struck by the traction car.

No train order restricting the authority of No. 47 over the freight had been issued, the report said, and under the rules the freight was required to clear the main track, or furnish flag protection, by 10:26 p. m. The employees on the freight "thought" the fusee and the open-switch protection signal provided sufficient protection against southbound trains. Another employee, stationed in a tower 958 ft. north of the protection signal, testified that it displayed red continuously for at least 8 minutes before the collision. The motorman of the traction car said he saw no fusee, and the report said it was evident that it burned out before his train reached it.

There were no fatalities, but 13 passengers and 2 employees were injured. The accident was caused, according to the report, by "an inferior train occupying the main track on the time of an opposing superior train, and by failure to operate the superior train in accordance with the signal displaying an open-switch indication." It "might have been prevented," the report continued, "if an adequate block system had been in use in this territory, since these opposing trains would not have been permitted to occupy the same block simultaneously."

Transverse Fissures Caused Seaboard Derailment

A broken rail, the result of transverse fissure, was the cause of the derailment January 2, near Blaney, S. C., of the Seaboard Air Line's southbound No. 43, the east coast "Silver Meteor," according to the report of an investigation by the Interstate Commerce Commission under the supervision of Commissioner Patterson. Two passengers were killed and 104 passengers and 14 employees were injured.

The accident occurred at a point 81.18 miles south of Hamlet, N. C., on the single-track main line from that point through Columbia, S. C., and Savannah, Ga., where trains were operated by timetable, train orders and a manual block system. The grade is 0.8 per cent descending southward and there is a 2-deg. curve to the left for southbound trains. The maximum authorized speed for this train was 60 m. p. h. and it was running at about that speed when derailed.

The track structure in the vicinity consists of 100-lb. rail, rolled and laid in 1935 on 22 treated ties per rail length, fully tieplated, single spiked, provided with 4-hole angle bars 24 in. long and an average of 12 rail anchors per rail length, and laid on crushed stone ballast 15 in. deep. The line had been inspected by the section foreman about 48 hours before the accident, and a detector car had been operated over

it October 12, 1945, at which time no defect was indicated.

The train consisted of a 3-unit Diesel-electric locomotive, one lightweight passenger-baggage car, 7 regular sleeping cars, 2 dining cars and 7 coaches, one of lightweight steel construction. At 5:14 a. m. the rear truck of the second Diesel unit, the third Diesel unit, the first to seventh cars, inclusive, the front truck of the eighth car, and the tenth to fourteenth cars, inclusive, were derailed. The first two locomotive units stopped about 1,700 ft. south of the point of the accident. The third unit stopped on its left side, in reverse position, east of the track and about 470 ft. south of the point of derailment. The first car, also on its left side, stopped close to the third engine unit, while the second to fifth cars, remaining coupled, stopped upright east of the track to the rear of the first car. The rest of the derailed equipment remained upright on the roadbed, and all of it was considerably damaged.

The train had been riding smoothly until it reached the point of the accident, when an unusual movement of the first engine unit was noticed. The engineer made an emergency brake application, but the derailment took place before speed could be materially reduced. A rail broken through the head, web and base at four places was found on the east side of the track, the first break being 33.36 ft. south of the receiving end of the rail. At three of the breaks there were transverse fissures which covered 10, 8 and 7 per cent, respectively, of the cross-sectional area of the head, none of which extended to the surface.

The investigation brought out the information that a southbound passenger train which had passed the point of the accident about 70 min. previously had been stopped about 1 mile south after the baggageman had signaled for a stop when some object struck the car he was in in the vicinity where the derailment occurred. The flagman of that train went to the rear about ¾ mile to provide flag protection, examining the track as he did so, but found no unusual condition. Examination of the train disclosed damage to the brake rigging of its second Diesel-electric unit, but after the damaged parts were removed the train proceeded without anyone examining the track where the damage occurred, according to the report.

After the derailment, particles of brass detected in the head of one piece of the broken rail indicated that it had been in contact with the damaged brake equipment, and it was concluded that two rail breaks occurred when the preceding train passed over the rail, a 1.44-ft. section being forced out of alinement at that time. Apparently the other two breaks occurred when the engine of the next train passed over this point, resulting in two other sections of the rail, aggregating 2.82 ft., being forced out of alinement.

Petition for Interstate Freight Trust Agreement Denied

The Interstate Commerce Commission has denied a petition filed by the United States Freight Company and the Hickok Oil Corporation for approval of a trust agreement providing for the disposition to the United States Trust Company of New York, as trustee for a 5-year period, of the stock in the Interstate Motor Freight System, now held by the petitioners.

As reported in *Railway Age*, April 6, page 744, the commission had ordered the two companies to divest themselves of control of Interstate, in the No. MC-F-2181 and related proceedings, and since then had refused to accept various proposed alternative arrangements as compliance with the order. The trust arrangement, the commission said, "is not in compliance with the requirements" of the divestment order.

Cost of Wage Raise Estimated by I.C.C.

(Continued from page 783)

Improved Capital Set-up—In contrast to this unfavorable showing in terms of investors' appraisal is another tabulation in the "Comment," which indicates the improvement in railway capital set-up since 1920. Covering Class I, II and III roads and their lessor companies, it shows that funded debt (including unmatured debt outstanding, matured funded debt unpaid, and equipment obligations) declined $667 million from the end of 1920 to the end of 1944, while the par value of stock outstanding increased $605 million. From 1930 to 1944 funded debt declined $2.191 million and stock declined $564 million. These figures reflect changes in capitalization resulting from reorganizations, the bureau explains.

As compared with the capitalization changes thus summarized, the depreciated investment in road and equipment increased by over $2,669 million from 1920 to 1944, although it declined $1,158 million from 1930 to 1944. "The reserve for amortization of defense projects, however, amounted to about $500 million at the close of 1944." In 1920 the funded debt was equivalent to 60.3 per cent of the depreciated investment, as compared with 49.7 per cent in 1944. At the end of 1920 the sum of funded debt and capital stock was 107.4 per cent of the investment, while at the close of 1944 that figure had been reduced to 93.8 per cent.

The bureau also comments on the relationship between total gross ton-miles (cars, contents and cabooses, including locomotives and tenders) in freight and passenger service combined and the total "maintenance man-hours" for Class I roads, measuring this relationship through index numbers computed by using 1937-1939 averages as a base. "As a result of war conditions," it points out, "the index of gross ton-miles rose abruptly each year beginning with 1941 until it reached a peak of 180 in 1944, receding to 170 in 1945. The index of maintenance man-hours followed a similar course, though lagging behind the index of gross ton-miles. The man-hour index increased sharply each year, from 104 in 1940 to 166 in 1944, and despite the decline in traffic volume, the 1945 index was the same as in the preceding year. Maintenance man-hours per million gross ton-miles declined from 934 in 1937 to 771 in 1942, but this decline halted in 1943. In that year the average rose to 783 hours and continued to advance to 810 hours in 1944 and to 854 hours in 1945."

Increased Use of Diesels—The continued increase in the use of Diesel-electric locomotives is the subject of discussion by the bureau again. As has been true each year since 1940, it says, the volume of freight traffic handled in Diesel-propelled trains, as measured in gross ton-miles, again increased sharply in 1945 over the preceding year, the percentage being 79, while the increase in gross ton-miles, 107 billions, was approximately double the 1944 increase over 1943. Coal-burning locomotives handled about 81 per cent of the gross ton-miles in 1940, but the proportion dropped to 71 per cent in 1945. In the same period the gross ton-miles produced by Diesel-electrics rose from 0.05 per cent to almost 7 per cent. Diesel-propelled trains accounted for 5.2 per cent of the passenger-train car-miles in 1940 as compared to 9.58 per cent in 1945. Between the same periods the relative position of coal-burning locomotives shows a decline of 7.85 percentage points, oil-burning locomotives an increase of 3.76 and electrics a decline of 0.29.

In its regular survey of operating results, the bureau noted that February freight revenues (daily basis) were 2.9 per cent greater than January but 21.5 per cent under February, 1945. The freight revenue index (based on the 1935-1939 monthly average as 100) for February was 173.7, as compared to 168.9 for January and 221.4 for February, 1945. The passenger index, similarly computed, was 362.4 for February, compared to 392.9 for January, 397.8 for February, 1945, and 414.7 for the same 1944 month. Passenger revenue was 7.7 per cent less, on a daily basis, in February than in the month before, and 8.9 per cent under February, 1945.

March carloadings, on an average weekly basis, for all commodities, were 1.1 per cent under the corresponding 1945 period, but revenue freight traffic in January showed a decline of 9.3 per cent in the number of tons carried and 15.1 per cent in the number of ton-miles, as compared with the same month of 1945, the report points out. The rate of decline in tons of freight carried in January was slightly less than in the preceding month, and the rate of decline in ton-miles also was smaller than in December, 1945. In January, as compared with the same month of the preceding year, the number of passengers carried declined 3.6 per cent, but the number of passenger-miles increased 1.1 per cent.

Turning to the outlook for the near future, the bureau notes that loadings of grain and products in March did not reach the Department of Agriculture's 60,000 cars per week goal. "Slippage" amounted to 12,700 cars weekly, "and can scarcely be made up during April." The April goal is 22.6 per cent higher than actual loadings in March, and "elevator inventories of grain are dangerously low," so that "it seems doubtful that the goal for April will be met by the actual movement."

April livestock loadings are expected by the Department of Agriculture to increase 6.6 per cent over last April, and 4.7 per cent over current loadings, the "Comment" notes, while estimated requirements for refrigerator cars total 172,000 cars, an increase of 11,100 cars over April, 1945, loadings. Merchandise l. c. l. loadings "continue to increase, and are now at a level almost equal to that of four years ago, when Gen-

eral Order O. D. T. No. 1 was being put into effect. There has been a distinct increase in l. c. l. tonnage, although there has also been some relaxation of the heavy loading order, under permit, for cars moving westward."

Equipment and Supplies

LOCOMOTIVES

The UNITED FRUIT COMPANY (Cia Agricola de Guatemala) has ordered six switching locomotives of the 2-8-2 type from the Baldwin Locomotive Works.

FREIGHT CARS

Pressed Steel Car's Production Reduced by Material Shortages

Material shortages substantially reduced the Pressed Steel Car Company's car production in the first three months of 1945, according to Ernest Murphy, president. With the resumption of steel-making, it is hoped that this situation will be improved by mid-year. During the first quarter, approximately 800 freight cars were shipped and about 1,300 cars are scheduled for production in the second quarter. At the end of March, the company had car and miscellaneous orders on its books amounting to $30,000,000.

Commenting upon the recently concluded arrangements to acquire the Mount Vernon Car Manufacturing Company on April 10, Mr. Murphy said the integration of these properties with those of Pressed Steel Car should make possible substantial economies in operation. During the period 1936-1945, Mount Vernon received orders for 33,000 freight cars, while in the same period Pressed Steel's orders totaled 46,000 cars.

The SOUTHERN has invited bids by April 22 for 2,100 freight cars, including 1,000 50-ton, 40½-ft. steel sheathed box cars; 600 50-ton, 41-ft. 6⅜-in. steel low-side gondola cars; 100 70-ton, 52-ft. steel low-side drop-end gondola cars; 250 70-ton, 40-ft. 8-in. steel ballast cars; and 150 70-ton steel covered hopper cars.

PASSENGER CARS

The CHICAGO & NORTH WESTERN has ordered, from the Pullman-Standard Car Manufacturing Company, 12 streamlined sleeping cars to be constructed at a cost of $1,287,000. The cars, which will replace equipment now operating between Chicago and St. Paul, Minn., and Minneapolis, will be built of high tensile steel and will include the latest types of equipment.

The CHICAGO & NORTH WESTERN has placed an order with the American Car and Foundry Company for 16 lightweight, streamlined passenger cars which are to be constructed at an approximate cost of $1,500,000. The cars will be added to streamliner service between Chicago, Denver, Colo., and West Coast points. The order includes four regular dining cars with a seating capacity of 48 persons each; two lunch counter-dining cars, three club-lounge cars which will be equipped with a large lounge section, barber shop and shower room; one cafe-lounge car, one mail and baggage car, two post-office mail storage cars and three baggage-dormitory cars.

SIGNALING

THE BOSTON & MAINE has placed an order with the Union Switch & Signal Company for 38 sets of automatic train control equipment for application to new Diesel-electric locomotives. Twenty sets of this equipment will be used on passenger locomotives. Twenty sets of this equipment will be used on passenger locomotives and 18 sets on freight locomotives. The equipment is arranged for operation as a 2-indication cab signal system, with whistle and acknowledger, in the territory between Boston, Mass., and Greenfield, and also as an intermittent inductive automatic train stop system in the Hoosac Tunnel.

The WESTERN PACIFIC has placed an order with the Union Switch & Signal Company for the necessary additions in the control machine, with new code line and carrier equipment, to control the recently installed centralized traffic control system between Oroville, Cal., and Portola from Sacramento, instead of from Keddie, as at present—Keddie being within the C.T.C. controlled territory, 76 miles east of Oroville, while the new control point at the Sacramento divisional headquarters is 66 mi. west of Oroville, the western end of the territory. The controlled territory has at present three sections of code line, only one of which is carrier controlled, while in the new arrangement all these sections will be carrier controlled. Two carriers will be transmitted 140 mi., the third 105 mi., and due to the length of transmission, carrier repeaters will be employed. The installation work will be handled by railroad forces.

Supply Trade

The **Apex Railway Products Company** has moved its Chicago office to the McCormick Building, 332 South Michigan Avenue.

Frank M. Urban, assistant merchandise manager, has been appointed merchandise manager of the mechanical goods division of **United States Rubber Company.**

Carleton P. Ross, recently released from the armed forces, has been appointed sales representative of the **Ross & White Co.,** of Chicago.

Robert Watson, mechanical engineer, western sales manager and assistant to the president of the **Waugh Equipment Company,** has been elected a vice-president.

John W. Weigt has been appointed manager of the New York branch of the **Electric Storage Battery Company** to succeed **D. P. Orcutt,** who has retired after 36 years' service with the company. Mr. Weigt, a graduate of Cornell, was an Army lieutenant during the first world war and joined Electric Storage Battery in 1920 as a salesman in the New York branch, covering the industrial truck and locomotive fields. He later took charge of sales work in those departments. In 1944, he also took charge of railway battery sales

John W. Weigt

For the past seven years Mr. Weigt has been mayor of the incorporated village of Thomaston, Great Neck, N. Y., where he resides.

At the annual meeting of the **Pressed Steel Car Company, H. J. Gearhart** was elected executive vice-president to succeed George H. Fleming; **C. P. Mapp, H. E. Chilcoat** and **G. J. Lindroth** were elected vice-presidents; **B. W. Harvey,** secretary, and **F. D. Evans,** treasurer. **L. J. Lieberthal** was appointed assistant to the president; **S. C. Borland,** assistant secretary, and **C. E. Waldron,** assistant treasurer.

Frank B. Baker has been elected vice-president of the **Pullman-Standard Car Manufacturing Company.** Mr. Baker, who has charge of purchases for all plants of the company, began his career in the railroad equipment business in 1912, when he left a position in the shops of the Mich-

Frank B. Baker

igan Central to become record clerk in the Haskell & Barker carbuilding plant at Michigan City, Ind. He rose through several stenographic positions to assistant purchasing agent, and was appointed supply agent at Chicago when Haskell &

Barker was merged with the Pullman Car & Manufacturing Co., in 1922. In 1934 Mr. Baker was appointed general purchasing agent of the Pullman-Standard Car Manufacturing Company, with offices in the car works division. He is also a director in the Pullman Trust and Savings Bank.

C. H. Jones, a chief clerk of the **Texas Company,** has been appointed assistant to the traffic manager at New York. **J. J. Roby,** also a chief clerk, has been appointed representative, western district, Chicago.

Henry W. Dodge, former vice-president and general sales manager of the Texas Company, has been elected chairman of the board of **Air Products, Inc.,** with offices in New York.

William Rosenthal, formerly vice-president and a director of the Hyman-Michaels Company, has been elected a vice-president of the **Purdy Company,** with headquarters at Chicago.

The **Republic Supply Company** of California has been appointed distributor in that state for the industrial rubber products of **Raybestos-Manhattan, Inc.,** Manhattan rubber division, Passaic, N. J.

The **Levitt Safety Appliances Company,** Toronto, Ontario, Canada, has been appointed a distributor in the provinces of Ontario and Quebec, for the line of dry chemical fire extinguishers, of the **Ansul Chemical Company,** Fire Extinguisher division, Marinette, Wis.

William P. Loyzelle has been appointed traffic manager for all divisions of the **American Locomotive Company** except the Railway Steel Spring division, with headquarters in Schenectady, N. Y. He succeeds **W. J. Hall,** who has retired. Mr. Hall was associated with American Locomotive since June 1, 1911.

Frank P. Swallow, assistant manager of the Logan Drinking Cup division, of the **United States Envelope Company,** has been appointed manager of the division to succeed **Donald B. Logan,** who has retired from the active duties of management, but will continue with certain sales promotion work.

H. Cubbie Roane has been appointed assistant district manager of the Atlanta, Ga., office of **Bowser, Inc.** Mr. Roane's territory will include North and South Carolina, Georgia, Florida, Alabama, Mississippi and eastern Tennessee. He formerly was division lubrication engineer with the Gulf Oil Corporation.

The **American Brake Shoe Company** has contracted to purchase the **Progressive Foundry Works, Inc.,** of Rochester, N. Y., subject to approval of Progressive's stockholders. Under Brake Shoe management, the foundry will continue to produce castings for Progressive's customers, in addition to introducing castings made by the process recently developed at Brake Shoe's metallurgical research laboratory. The new plant will be operated as a new division of American Brake Shoe. It will be under the direction of W. T. Kelly, Jr., president of Brake Shoe's Kellogg division. Howard S. Van Billiard, president of Progressive Foundry, will continue as manager. No changes in personnel are contemplated.

James C. Peugh has been appointed sales and service engineer to cover the western part of the United States for the **Paxton-Mitchell Company** of Omaha, Neb. A graduate of Kansas State University and formerly connected with the Missouri Pacific, Mr. Peugh has just returned from 39 months' service with the army. **James J. Keliher,** chief service engineer and assistant to the president of Paxton-Mitchell since 1932, has retired. Affiliated with the company since 1910, Mr. Keliher was born in North Platte, Neb., in 1880 and began work with the Union Pacific in that city in 1895.

C. D. Fey, formerly with the sales, purchasing and special products departments of the Caterpillar Tractor Company, and **J. L. Nordine,** formerly with the maintenance of way, evaluation and bridge and building sections of the Alton's engineering department, have been appointed specialized industrial sales district representatives for **R. G. LeTourneau, Inc.** Mr. Fey, with headquarters in Peoria, Ill., has been assigned to work with LeTourneau railroad distributors in Chicago, St. Louis, Mo., Kansas City, Mo., and Omaha, Neb. Mr. Nordine will work out of Philadelphia, Pa., and will contact railroad distributors there and in Pittsburgh, Pa., Baltimore, Md., and Columbia, S. C.

OBITUARY

L. J. Papineau, vice-president of the Canadian Johns-Manville Company, Ltd., in charge of the transportation department, died April 3. He was 60 years of age, and had been associated with the firm since 1911.

Bengt E. Folke, mechanical engineer and a director of the Nathan Manufacturing Company, whose death on March 25 was reported in the *Railway Age* of March 30, was born in Sweden in 1903. He was

Bengt E. Folke

educated at the Polytechnic Institute of Orebro, Sweden, and came to the United States in 1922. He was employed with the Great Northern as locomotive shop foreman from 1922 to 1924 and as locomotive designer from 1924 to 1927. He served as assistant mechanical engineer of the Chicago, Indianapolis & Louisville from 1927 to 1933 and was appointed mechanical engineer of the Nathan Manufacturing Company in 1934.

Alfred E. Jones, consultant and service engineer of the general railway department of the Crucible Steel Company of America, died March 24. Mr. Jones was associated with Crucible for 43 years. He formerly was representative in the northeastern part of the United States for the company's railroad department.

Construction

CHICAGO JUNCTION - INDIANA HARBOR BELT.—The Federal Works Agency has advanced $58,000 to the city of Chicago for the completion of plans and estimates on a $1,800,000 viaduct project to extend South Damen avenue over the tracks of these carriers.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—The Federal Works Agency has advanced $100,000 to the city of Chicago for completion of plans and estimates on a $4,000,000 grade separation project for the construction of five grade structures to eliminate the grade crossings of North Central, Caldwell and Devon Avenues and to extend Bryn Mawr and Hiawatha Avenues over the double-track line of this railway. The project also requires a new railway bridge over the north branch of the Chicago river and involves the relocation or rebuilding of the road's Edgebrook suburban station. When completed it will eliminate the last grade crossing in Chicago on the Milwaukee's high-speed line to Milwaukee, Wis., Minneapolis, Minn., and St. Paul, Minn., and the Pacific Northwest.

GULF, MOBILE & OHIO.—This company has asked the Interstate Commerce Commission for authority to construct a connecting track on Front street, East St. Louis, Ill., 0.8 mile long, physically joining its line with that of the Alton. The company at present has trackage rights arrangements to operate on a line on Front street of the Terminal Railroad Association of St. Louis, but its application indicates that it prefers to own the connection between its line and that of the Alton, which road it is in the process of acquiring.

Financial

ANN ARBOR.—*Annual Report.*—Operating revenues of the Ann Arbor in 1945 were $6,123,270, compared with $5,946,354 in the preceding year, an increase of 2.98 per cent. Operating expenses amounted to $4,968,754, compared with $4,561,260. Net income was $331,123, compared with $423,120.

BOSTON & MAINE.—*Refunding Building Mortgage.*—Division 4 of the Interstate Commerce Commission has authorized this company to assume liability for $1,250,000 of 3 per cent 15-year serial first mortgage bonds of the North Station Industrial

Building, Inc., at Boston, Mass., covering property leased by the railroad. The application (*Railway Age* of March 16, page 592) indicated that the John Hancock Mutual Life Insurance Company had agreed to purchase such bonds with a 4 per cent interest rate, but the division expressed the opinion that the proposed rate is too high in view of current interest rates on obligations of various railroad companies, and therefore made its approval of the transaction conditional upon a reduction of the rate. The railroad has been paying the building company a rental sufficient to service $1,292,000 of outstanding first mortgage 5 per cent bonds, which it is proposed to refund with the proceeds of the new issue, with the rental payments being reduced proportionately.

CANADIAN PACIFIC.—*Annual Report.*—Gross earnings of the Canadian Pacific in 1945 amounted to $316,109,358, compared with $318,871,034 in the preceding year. Operating expenses, including taxes, totaled $280,055,024, compared with $275,711,370. Net income, after fixed charges, was $31,614,162, compared with $34,699,830. Current assets at the year-end exceeded current liabilities by $82,854,705, or 175 per cent. At the end of 1944 the excess was $88,484,875.

Shareholders of the company will be asked to approve appropriations of $42,039,447 for the year 1946. The principal outlays would be $2,814,995 for additions and betterments to stations, freight sheds, coaling and watering facilities and engine houses; $1,019,374 for replacement and enlargement of structures in permanent form; $1,360,936 for tie plates, rail anchors and miscellaneous roadway betterments; $1,086,640 for replacement of rail in main line and branch line tracks with heavier section; $1,681,092 for installation of automatic signals; $1,445,757 for additional terminal and side track accommodation; $1,017,258 for additions and betterments to shop machinery; $16,840,399 for new rolling stock; $1,095,802 for additions and betterments to rolling stock; $12,684,593 for ocean and coastal steamships, and $764,507 for additions and betterments to communication facilities. The appropriations for new rolling stock provide for 40 Pacific type steam locomotives, designed primarily for branch operations, and 14 Diesel-electric switching locomotives; 1,750 freight cars and 52 units of work equipment.

GREAT NORTHERN.—*Refunding.*—Division 4 of the Interstate Commerce Commission has authorized this company to issue $40,000,000 of series P general mortgage 2¾ per cent gold bonds, due in 1982, and $30,000,000 of series Q general mortgage 2⅝ per cent gold bonds, due in 2010, both issues having been sold at 98.071 to Morgan Stanley & Company and others, making the average annual cost about 2.75 per cent. The proceeds and other funds are to be applied to the redemption of the following outstanding general mortgage gold bonds: $30,000,000 of 3⅜ per cent series L, due in 1970 and callable at 105⅛; $35,000,000 of 3½ per cent series M, due in 1980 and callable at 105¾; and $10,000,000 of 3⅛ per cent series K, due in 1960 and callable at 105⅞. An additional $25,000,000 of the series K are being refinanced in a separate transaction. (Previous item in *Railway Age* of April 6, page 748.) The refunding here approved by the division is expected to result in a net saving of $8,549,993.

GULF, MOBILE & OHIO.—*Merger with Alton.*—Stockholders of the Gulf, Mobile & Ohio, at the annual meeting in Mobile, Ala., on April 8, approved the proposed merger of that line with the Alton. Holders of 77.32 per cent of the shares voted in favor of the proposal. In furtherance of this action, the stockholders voted in favor of a plan to issue, to the holders of Alton 3-per cent first-mortgage bonds, $22,675,000 in G. M. & O. general mortgage income bonds, and for the issuance of 327,787 ½ shares of no par common stock, an increase in the authorized common stock from 609,847 shares to 988,635 shares, and also for assuming the leases and financing of three leased lines operated as part of the Alton system. The proposed merger, which is expected to be completed by late summer, will create a new 3,000-mile railroad system extending from Mobile and New Orleans, La., to Chicago and Kansas City, Mo., by way of St. Louis, Mo. It has already been approved by the Interstate Commerce Commission and by Federal Judge John P. Barnes, who has jurisdiction over the reorganization proceedings of the Alton. Alton bondholders, however, have not yet formally been asked to approve the plan.

ILLINOIS CENTRAL.—*Merger of Subsidiaries.*—Division 4 of the Interstate Commerce Commission has authorized this company to purchase the properties of the following subsidiary railroad companies, all the capital stocks of which are owned by it: Benton Southern, 5.48 miles; Bloomington Southern, 9.16 miles; Blue Island, 4.26 miles; Dunleith & Dubuque Bridge, 1.3 miles; Fredonia & Reeds, 1.77 miles; Golconda Northern, 12.77 miles; Herrin Northern, 0.95 mile; Kensington & Eastern, 6.19 miles; and St. Louis Belleville & Southern, 11.54 miles. The Bloomington Southern was controlled by the Mississippi Valley Corporation, a subsidiary of the Illinois Central, but its acquisition by the parent company has been approved by the division along with the mergers. All of the properties involved have been operated by the I. C. under lease, and the transactions will not affect its operation except to simplify the system capital structure through elimination of the subsidiary corporations.

LEHIGH & NEW ENGLAND.—*Annual Report.*—Total railway operating income in 1945 amounted to $5,735,351 and railway operating expenses $5,427,505, including $1,024,607 for accelerated amortization of defense projects. The net income for the year was $209,404.

MISSOURI-KANSAS-TEXAS.—*Annual Report.*—Railway operating revenues for 1945 totaled $83,093,893, compared with $84,022,041 in the preceding year. Operating expenses were $57,134,076, compared with $58,814,884. Net income amounted to $5,867,598, compared with $6,110,114.

NEW YORK, CHICAGO & ST. LOUIS.—*Annual Report.*—Moving to expedite traffic and increase operating efficiency in the postwar competition for business, the New York, Chicago & St. Louis is undertaking extensive improvements to its property, which were postponed in the war period by the scarcity of manpower and materials, John W. Davin, president, states in the 1945 annual report. "Construction projects and new rail authorized but not completed will require a further expenditure of approximately $15,341,077," he says, noting that in the years 1941 through 1945 the Nickel Plate spent $32,570,164 on road improvements and new equipment. Among improvements already made and contemplated, the report notes installation of centralized traffic control on several sections of line, interlocking plant installations, automatic signals, teletype, bridge renewals, and wide equipment improvements, both passenger and freight.

Along with the physical improvement of the property, the Nickel Plate achieved improvement in its financial position in 1945. Net income was $8,083,229 as compared with $7,225,924 in 1944, an increase of 11.86 per cent. Total taxes were $26,597,678 less than in 1944, railway tax accruals for the year being a credit of $3,424,663, compared with a debit of $23,173,015 in 1944. The railroad's accelerated amortization of defense projects, which played a part in the tax reduction, was $12,155,004, in addition to regular 1945 amortization charges of $3,268,696.

The Nickel Plate refunded in two operations, in 1945, all of its debt other than equipment obligations. On December 31, 1945, total bond and equipment debt was $115,360,222, a reduction of $3,751,695 during the year. The reduction in debt and the refunding at lower rates cut interest and other fixed charges to approximately $3,820,000 a year, compared with $5,310,000 in 1944 and $7,502,000 in 1936. Since 1936 the total debt has been reduced $44,984,179, or 28.05 per cent.

NEW YORK, ONTARIO & WESTERN.—*Annual Report.*—Railway operating revenues in 1945 amounted to $7,763,042, as compared with $9,244,351 in 1944, and railway operating expenses amounted to $7,743,718, as compared with $8,915,107. Net revenues from railway operations in 1945 totaled $19,324 as compared with $329,244 in the preceding year. The net deficit totaled $2,630,326 as compared with a loss of $2,947,253 in 1944.

NORFOLK & WESTERN.—*Annual Report.*—The Norfolk & Western's operating revenues in 1945 amounted to $144,863,000, a decrease of $14,735,516 or 9.23 per cent under 1944. The balance of income, amounting to $22,679,000, increased approximately $500,000 over the preceding year. Operating expenses amounted to $98,924,000, an increase of $9,211,619 or 10.27 per cent, due primarily to charges on account of accelerated amortization of defense projects.

The results of reconversion from wartime production to peacetime were reflected in the company's revenue freight traffic. In 1945, total revenue freight tonnage amounted to 66,577,745 tons, a decrease of about seven per cent from 1944. Revenue passengers totaled 4,612,549, a decrease of approximately 11 per cent under the year before, which was due primarily to the curtailment of mass troop movements.

Tax accruals for the year amounted to

(*Continued on page 795*)

PULLMAN INCORPORATED

SUMMARY OF ANNUAL REPORT FOR 1945

Sleeping and Parlor Car Operations

Maintaining the high standard of its outstanding war performance, Pullman in 1945 successfully met the burden imposed upon its sleeping car service by the radically shifting tides of troop traffic precipitated by V-E and V-J Days—occurring only three months apart—and the ensuing heavy demobilization of troops during the closing four months of the year which was accelerated beyond the originally scheduled program by debarkation of more than a million men per month at East and West Coast ports for discharge and distribution to their homes.

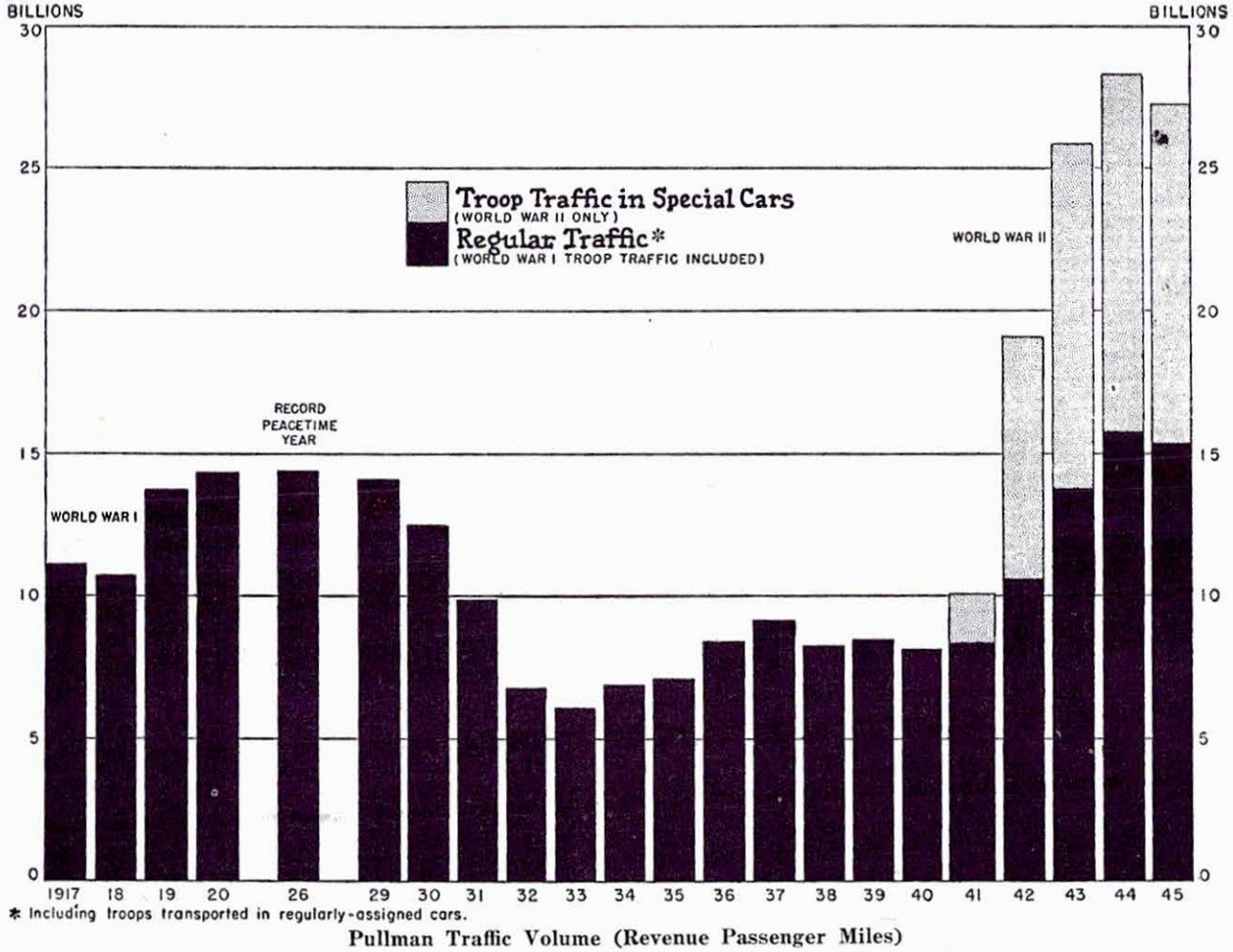
With more than two-thirds of all of its sleeping car accommodations continuously assigned to troop movements, the Pullman service available for civilian travel was directly and vitally affected throughout the year. The year witnessed a large-scale displacement of civilian travel as the result of restrictions imposed by Order No. 53 of the Office of Defense Transportation, effective July 15, 1945, discontinuing all civilian sleeping car service on trips of 450 miles or less, combined first with a 5-day limit and later a 14-day limit on advance Pullman reservations. These curbs on Pullman service were lifted March 15, 1946, and with the easing of military demands now under way it is expected that fairly normal conditions with respect to sleeping car service for civilian passenger travel will have returned by June 1, 1946, in time to accommodate the prospective high tide of tourist, recreation and vacation travel this coming summer.

Passenger miles for the year 1945 aggregated 27.3 billions, or about 4% below the record level of 1944. Military traffic accounted for nearly one-half of that total. Since Pearl Harbor, Pullman has performed a record volume of over 100 billion passenger miles of service to civilian travelers and to members of the armed forces. This huge volume of wartime traffic enabled Pullman, despite sharply increased costs, to operate profitably under rates which yielded an average revenue of only 5.5 mills per passenger mile. This was 12.7% below the average rate of 6.3 mills per passenger mile for the five prewar years (1937-41), and was the lowest in over twenty years due to the enlarged element of low-rated troop movements which were handled at an average rate of approximately 3.2 mills per passenger mile, or less than half the average rate at which the standard class business is handled. The chart below discloses that out of the impressive total of 27,300,000,000 miles of passenger service performed by Pullman in 1945, approximately 12,000,000,000 passenger miles were performed in carrying organized troop movements.

Manufacturing and Engineering Operations

Pullman-Standard Car Manufacturing Company: Manufacture of war matériel for the various branches of the armed services constituted about two-thirds of the year's output in the Pullman-Standard division. With exception of some U. S. Military Cars, all armament orders were cancelled immediately following V-J Day. The pattern of railway car building in 1945 followed that previously set by the exigencies of the war, although a large backlog of car orders for the Railroads had accumulated at the year's end.

Pullman-Standard has completed the transition from war to peacetime operations, and production of freight and passenger cars for both domestic and foreign railways is expected to assume very substantial proportions in 1946. However, the present outlook for freight car buying is clouded by uncertainties, principal among which are the repressive effect of war plant shutdowns on railway traffic and earnings and the lag in industrial production caused by the nationwide strikes in major industries. The interference of these strikes with the major sources of car-building materials, as well as local or sympathetic strikes in some of the Pullman-Standard plants, has seriously affected



Pullman Traffic Volume (Revenue Passenger Miles)

production and earnings of that Company during the first two months of the year. There are plenty of cars on the books to be built, but as a result of these strike interferences, the car manufacturing subsidiary is not yet back to a substantial earning level.

The renewal of passenger-car buying that began in 1944 expanded sharply toward the close of 1945 when large orders or authorizations by several major railroads established beyond doubt the nationwide character and magnitude of the trend toward modernization of railway passenger service. The year ended with firm orders on file with the car building industry for approximately 1,900 passenger cars, including nearly 500 Sleepers—all of lightweight construction. This Corporation's car manufacturing subsidiary held a major proportion of these unfilled orders for passenger cars on hand at the close of 1945 and a total of $148 millions of unfilled orders for products of all kinds at the 1945 year-end.

The M. W. Kellogg Company: The year 1945 brought the first anniversary of the Kellogg Company's membership in the Pullman group of companies, all of whose diverse interests were unified by important contributions to the successful conclusion of the war effort and by their common service to American industry. One of the great wartime feats of American technology was the important part taken by your Kellogg Company subsidiary in perfecting the processes underlying production in quantity of the fission material for atomic bombs. The Kellogg division entered 1946 with total unfilled orders for $34 millions of business.

Developments in Connection With Pullman Separation Procedures

Supplementing the information conveyed to Stockholders from time to time in previous annual reports, quarterly financial statements, and special communications up to the letter to Stockholders under date of January 2, 1946, we now report that the U. S. District Court at Philadelphia having jurisdiction in this case, entered on January 4, 1946 its final order approving the sale of Pullman Incorporated's holding of stock of The Pullman Company to a Railroad Buying Group, under the executory contract constituted by that Group's unqualified acceptance of Pullman Incorporated's proposal of May 12, 1945.

On March 4, 1946, just prior to the expiration of the appeal period, the Federal Department of Justice filed notice of an appeal to the U. S. Supreme Court, from the District Court's final order of January 4, 1946. Otis & Company, Glore, Forgan & Co., and the Chesapeake & Ohio, Nickel Plate and Pere Marquette railroad companies, interveners in this case, have also filed their notices of appeal, and appeal to the U. S. Supreme Court has been allowed by the District Court. According to the expectation stated in the District Court on March 4th by the representative of the U. S. Department of Justice, these appeals will appear on calendar for the October term of the U. S. Supreme Court.

In these appeal documents there are numerous allegations of error in the District Court's final order of January 4th, but the general basis of the several appeals is that a sale of The Pullman Company to the Railroad Buying Group is not in the

CONSOLIDATED INCOME ACCOUNT

FOR YEARS ENDED DECEMBER 31, 1945 AND 1944
(INCLUDING THE M. W. KELLOGG COMPANY)

	1945 Before Renegotiation	1944 Before Renegotiation
	(Cents Omitted)	
CAR SERVICE OPERATIONS:		
Gross operating revenue	$161,561,518	$165,692,598
Less:		
Operating expenses	$122,735,194	$110,898,200
Provision for retroactive wage adjustment	—	692,750
Provision for depreciation	10,957,018	10,976,781
	$133,692,213	$122,567,731
	$ 27,869,305	$ 43,124,867
Less:		
Provision for contract revenue payments to railroads (x)	13,647,088	19,079,504
Provision for Federal taxes on income	8,620,863	17,967,010
	$ 22,267,952	$ 37,046,514
	$ 5,601,353	$ 6,078,352
Reserves for Deferred Maintenance of Pullman Cars Credited to Expenses	2,932,207	2,743,910
Net Earning	$ 8,533,560	$ 8,822,262
MANUFACTURING AND ENGINEERING OPERATIONS:		
Sales and miscellaneous revenues	$194,529,041	$286,629,741
Less:		
Cost of goods sold and operating expenses	$170,061,280	$249,832,080
Provision for retroactive wage adjustment	—	[illegible]
Provision for depreciation	2,318,683	2,369,760
Selling and administrative expenses	6,082,799	5,219,230
Interest, fees and expenses on VT Loan	153,863	243,780
Gain on manufacturing property sold	*494,870**	*144,884**
Provision for Federal taxes on income	11,445,966	22,913,413
	$189,567,721	$281,070,845
Net Earning	$ 4,961,319	$ 5,558,895
INVESTMENT OPERATIONS:		
Income from securities and miscellaneous items	$ 1,010,294	$ 1,089,274
Profit on securities sold	13,072	66,078
	$ 1,023,367	$ 1,155,352
Less: Miscellaneous income deductions	$ 63,771	$ 37,657
Administrative expenses of Pullman Incorporated	265,916	332,842
Provision for Federal taxes on income	298,334	316,000
	$ 628,021	$ 686,499
Net Earning	$ 395,345	$ 468,852
	$ 13,890,226	$ 14,850,011
FEDERAL POSTWAR TAX REFUND:		
Claim for Postwar Refund on 1944 Excess Profits Tax	—	$ 3,551,333
Less: Appropriation to Reserve for Postwar Re-adaptation of Manufacturing Plants, Pullman Equipment and Contingencies	—	3,551,333
	$ 13,890,226	$ 14,850,011
DEDUCT:		
Net Income of The M. W. Kellogg Company prior to acquisition and consolidation	—	1,960,005
CONSOLIDATED NET INCOME CARRIED TO SURPLUS	$ 13,890,226	$ 12,890,006

* *Figures in italics denote a gain.*
(x) Railroads' contractual share of The Pullman Company sleeping and parlor car revenues.

[Advertisement]

public interest. As appellees in the case, Pullman Incorporated and The Pullman Company, will of course take all proper steps to uphold the District Court's approval of a sale of The Pullman Company to the Railroad Buying Group, as contemplated by the existing executory contract between Pullman Incorporated and the Railroad Buying Group.

Following allowance of appeal to the U. S. Supreme Court, the District Court entered an interim order under date of March 4, 1946 providing that The Pullman Company under its present ownership and management be authorized and instructed to continue to furnish sleeping car service on the lines of Railroads of the Buying Group and of such other Railroads as may desire service, until further order of the Court, with the Court reserving the right to make such modifications of this order, if any, as may be necessary after the coming down of the mandate of the Supreme Court.

In the meantime, under an interim order of the U. S. District Court entered on December 26, 1945, authorizing The Pullman Company to sell sleeping cars to individual Railroads under contract rights contained in their operating agreements with The Pullman Company which had been terminated as of December 31, 1945, and in pursuance of that authorization The Pullman Company had proceeded to effectuate, as of December 31, 1945, the sale of all the lightweight sleeping and composite cars that had been regularly assigned to individual Railroads, under provisions in the operating agreements that gave to the individual Railroads the right to buy these cars at depreciated book value. These sales, in total amount $34,309.526, are reflected in the Consolidated Balance Sheet as of December 31, 1945, and all of the accounts receivable representing those sales have now been collected in cash.

The Consolidated Balance Sheet of December 31, 1945, also reflects the sale, in total amount $1,685,316, to individual Railroads or other purchasers, of all the other heavyweight cars—not of sleeping car type—previously owned by The Pullman Company, except a few private and parlor cars which it is expected will eventually be disposed of. The parlor and private car services, and the equipment used in connection therewith, were not involved in the anti-trust suit against the Pullman group of companies, or in any of the Court decrees or orders entered in that case, and the sales effected have had the practical result of disposing of Pullman Incorporated's stock equity in this equipment, the operation of which, however, is being continued by The Pullman Company and temporary lease arrangements are under negotiation with the new owners of such parlor and private cars.

The lightweight sleeping and composite cars that have been sold to the individual Railroads also continue to be operated by The Pullman Company and temporary lease arrangements with the various individual Railroad owners of these cars are under consideration. The seven lightweight sleeping cars that were not regularly assigned and have therefore not been sold to individual Railroads, continue in the ownership of The Pullman Company and are included in the list of assets to be taken over, along with the heavyweight sleeping cars, miscellaneous operating properties and inventories when any sale of the stock control of that Company is effectuated following disposition of the Appeal to the U. S. Supreme Court.

Completion of sale of the stock of The Pullman Company as well as the properties already sold would have the effect of converting Pullman Incorporated's investment equity in the cars, miscellaneous properties and material inventories of The Pullman Company into approximately $74,000,000 of cash in the hands of Pullman Incorporated. In view of the suspension of the sale of Pullman Company stock to the Railroad Buying Group as the result of the appeal to the U. S. Supreme Court, it would be premature at this time to make any statement or proposals in regard to disposition of any net increase in the consolidated cash position of the Pullman group of companies that may occur when these sales shall have been completed and all necessary reserves shall have been provided.

As was pointd out in the letter report of January 2, 1946 to stockholders—

> "It is the opinion of your management that from the standpoint of interest of employes of The Pullman Company and the stockholders of Pullman Incorporated, sale of The Pullman Company to the Railroad Buying Group is the most practical and desirable solution that could be worked out within the rigid requirements of the Court's 'complete and perpetual separation' decree. The Railroads constituting the Buying Group are proceeding actively with the purchase of many new sleeping cars, and there is abundant indication that they intend to make every effort to maintain and expand the sleeping car business after it comes into their ownership."

At this point reference is again made to what was said in the Annual Report for 1944, about the desirability of consolidation in Railroad ownership of the now separate and in part at least—diverse interests of the Railroads and of Pullman in the transportation and accommodation phases of the sleeping car travel service. Such consolidation would give to the combined enterprise the benefit of an integrated handling of the vital rate-making function and would also assure the continuity of operating opportunity that is a prerequisite for the large, long-term, new investment necessary to equip this service adequately to meet postwar competitive conditions.

THE PULLMAN COMPANY

Traffic and Operating Statistics
Comparative Statement for Years Ended December 31

Item	1941	1942	1943	1944	1945
Cars Owned	7,048	7,121	7,747♭	8,336♭♭	7,855♭♭♭
Cars Operated	5,303	6,368	7,096	7,485	7,291
Car Miles	878,057,274	1,071,254,181	1,222,676,452	1,326,580,210	1,346,583,539
Revenue Passengers:					
Berth	13,166,554	21,008,309	26,561,931	29,299,136	25,330,871
Seat	3,744,167	5,054,240	6,069,968	6,538,772	6,153,261
Total	16,910,721	26,062,549	32,631,899	35,837,908	31,484,132
Revenue Passenger Miles	10,070,406,876	19,071,589,061	25,891,465,679	28,267,090,536	27,275,788,709
Operating Revenue*	$ 67,040,587	$ 99,722,785	$ 124,960,365	$ 146,613,094	$ 147,914,430
Average per Car Operated	$ 12,642.01	$ 15,659.99	$ 17,609.97	$ 19,587.59	$ 20,287.26
Expenses**	$ 65,307,638	$ 93,235,511***	$ 120,639,898	$ 137,790,832†	$ 139,380,869‡
Average per Car Operated	$ 12,315.23	$ 14,641.25	$ 17,001.11	$ 18,408.93	$ 19,116.84
Net Carrier Earning△	$ 1,732,949	$ 6,487,273***	$ 4,320,467	$ 8,822,262	$ 8,533,560
Traffic Averages:					
Average Operating Revenue per Passenger	$ 3.96	$ 3.83	$ 3.83	$ 4.09	$ 4.70
Average Net Carrier Earning per Passenger	$ 0.10	$ 0.25	$ 0.13	$ 0.25	$ 0.27
Average Net Carrier Earning per Car per Day	$ 0.90	$ 2.79	$ 1.67	$ 3.23	$ 3.21
Average Mileage per Car Operated	165,577	168,225	172,305	177,232	184,691
Average Journey per Passenger (Miles)	596	732	793	789	866
Average Miles per Car per Day	454	461	472	485	506
Average Loading per Car (Passengers)	11.47	17.80	21.18	21.31	20.26

* From all sources after deducting contract revenue payments to Railroads.
** Including allocated portion of Federal taxes on income.
*** After appropriation of $2,500,000 to reserve for postwar re-adaptation of Pullman equipment.
† After credit of $2,743,910 covering 1942 Deferred Maintenance.
‡ After credit of $2,932,207 covering 1943 Deferred Maintenance.
△ After provision for Federal taxes on income.
♭ Including 626 special Government-owned troop cars installed late in 1943 and operated for Army Transportation Corps.
♭♭ Including 1,238 special Government- and Railroad-owned troop cars installed late in 1943 and early in 1944, and operated for Army Transportation Corps.
♭♭♭ Including 1,667 special Government- and Railroad-owned troop cars installed late in 1943 and early in 1944 and in late 1945 and operated for Army Transportation Corps. Does not include 601 Lightweight Cars sold to Railroads in December 1945.

NORFOLK AND WESTERN RAILWAY COMPANY

Summary of Fiftieth Annual Report for 1945

Railway Operating Revenues decreased $14,736,000, or 9.23 per cent, under 1944. Railway Operating Expenses increased $9,212,000, or 10.27 per cent. Balance of Income, after deducting Sinking and Reserve Funds Appropriations, increased $494,000. In 1944 there was a non-recurring charge of $7,930,000 representing miscellaneous appropriations account Excess Profits tax post-war credits for 1942-1944. After deducting dividends on Adjustment Preferred Stock, the balance remaining, $21,799,000, was equivalent to $15.50 per share of Common Stock held by the public.

Condensed Income Statement

	1945		Comparison with 1944	Per Cent.
Railway Operating Revenues	$144,863,518.76	Dec.	$14,735,516.27	9.23
Railway Operating Expenses (See Note 1)	98,924,453.32	Inc.	9,211,619.43	10.27
Net Revenue from Railway Operations	$45,939,065.44	Dec.	$23,947,135.70	34.27
Railway Tax Accruals:				
Federal $33,054,828.29				
Less: Credit (See Note 2) 6,131,000.00				
	$26,923,828.29			
State, County and Local 5,714,036.36	32,637,864.65	Dec.	19,037,167.00	36.84
Railway Operating Income	$13,301,200.79	Dec.	$4,909,968.70	26.96
Rent Income—Equipment and Joint Facilities—Net	9,466,216.59	Inc.	1,733,851.98	22.42
Net Railway Operating Income	$22,767,417.38	Dec.	$3,176,116.72	12.24
Non-Operating Income (See Note 3)	2,989,510.96	Dec.	4,046,817.56	57.51
Total Income	$25,756,928.34	Dec.	$7,222,934.28	21.90
Deductions from Total Income:				
Interest on Funded Debt	$2,106,008.26	Dec.	$7,625.02	.36
Other Deductions	117,240.23	Dec.	1,467.27	1.24
	$2,223,248.49	Dec.	$9,092.29	.41
Net Income	$23,533,679.85	Dec.	$7,213,841.99	23.46
Sinking and Reserve Funds—Appropriations	854,756.50	Inc.	222,718.88	35.24
Miscellaneous Appropriations (See Note 4)		Dec.	7,930,482.30	100.00
Balance of Income	$22,678,923.35	Inc.	$493,921.43	2.23
Dividends on Adjustment Preferred Stock — $4.00 per share	879,392.00	Dec.	1,932.00	.22
Balance Transferred to Earned Surplus	$21,799,531.35	Inc.	$495,853.43	2.33

Note 1—Includes $15,319,000 balance of unaccrued amortization of defense projects completed prior to September 1, 1945.

Note 2—Adjustment of Income and Excess Profits taxes due to amortization charges applicable to prior years.

Note 3—1944 included $4,810,482.30 Excess Profits tax post-war credits for 1942 and 1943.

Note 4—Excess Profits tax post-war credits for 1942-1944, appropriated from Income in 1944 and transferred to Earned Surplus in 1945.

Condensed Earned Surplus—Unappropriated

Credit Balance, January 1, 1945		$193,227,316.99
Credits:		
Balance Transferred from Income	$21,799,531.35	
Miscellaneous Credits	8,427,795.08	
Total Credits		30,227,326.43
		$223,454,643.42
Charges:		
Appropriation of Surplus for Dividends on Common Stock—$13.00 per share	$18,284,279.00	
Miscellaneous Charges	1,316,645.64	
Total Charges		19,600,924.64
Credit Balance, December 31, 1945		$203,853,718.78

Dividends

Dividends were paid upon the outstanding Adjustment Preferred Stock at the annual rate of $4.00 per share, or $879,000. Dividends were paid upon the outstanding Common Stock in 1945 at the annual rate of $10.00 per share, and an extra dividend of $3.00 per share was paid March 9, 1946, out of 1945 earnings, making a total distribution of $13.00 per share, or $18,284,000.

Taxes

Railway Tax Accruals, after credit adjustments, were $32,638,000, a decrease of $19,037,000, or 36.84 per cent. Taxes amounted to $1,486 for each employee, to $23 for each share of Common Stock, to 23 cents per dollar of Operating Revenues and to 6 per cent. of Railway Property Investment. Federal taxes, $26,924,000, representing 82 49 per cent. of all tax accruals for the year, decreased $19,083,000, or 41.48 per cent. Included in this amount were accruals for Normal tax and Surtax, $14,150,000, Excess Profits tax, $9,100,000, after credit adjustments, Railroad Retirement and Unemployment Insurance taxes, $3,240,000, and Capital Stock tax, $405,000. The decrease in Federal taxes was due in part to reduced revenues, but principally to adjustments resulting from revision of Federal tax legislation and accelerated amortization expense charges in 1945.

Amortization of Defense Projects

This Company had received authority from the Government to amortize, over a five-year period, expenditures totaling $33,463,000, incurred in connection with national defense and the war effort. Of this amount $17,936,000 had been charged off as of December 31, 1944. Following proclamation by the President of the United States on September 29, 1945, ending the emergency period, the Company terminated the amortization period, and in 1945 charged to Operating Expenses $15,319,000, the unamortized balance of such emergency expenditures, except for facilities sold or retired, otherwise accounted for, amounting to $208,000. The termination of the amortization period resulted in reduction of tax liability of $2,246,000 for 1945 and $6,131,000 for prior years, aggregating $8,377,000, which is reflected in lower excess profits tax accruals for 1945.

Reserve Fund for Taxes and Contingencies

The Reserve Fund for Taxes and Contingencies aggregated $58,705,000, which is invested in United States Government securities. Total taxes accrued for the year and payable in 1946 were $38,769,000, before credit adjustments.

Abnormal wear and tear, experienced by the Company's property during the war period, and deferred improvements and expansion of facilities will require expenditure of large sums. The reserve will be used for such expenditures when critical materials and essential manpower are available, as well as for the payment of future tax obligations and other contingencies.

Financial

The Capital Stock of the Company held by the public was $162,638,500, and represented 76.29 per cent. of outstanding stock and bond capitalization. On December 31, 1945, the Company's stockholders numbered 13,979.

The total Funded Debt held by the public was $50,538,331.92, and represented 23.71 per cent. of outstanding capitalization. Fixed charges were earned 12.04 times in 1945 and an average of 13.80 times over the last ten years.

At the end of the year appropriations to the voluntary sinking fund for retirement of direct Funded Debt and income from investments totaled $3,014,000, and investments in securities had a market value of $3,177,000.

Wage Demands

During 1945 demands for wage increases and for revision of working rules were received from organizations representing practically all operating and non-operating employees. The demand of the non-operating employees for a uniform increase of 30 cents per hour is now being arbitrated in accordance with provisions of the Railway Labor Act. The operating brotherhoods demanded a wage increase of 25 per cent., or $2.50 per basic day, whichever is larger. Three of the brotherhoods agreed to arbitration under the Railway Labor Act, deferring for the

present the matter of working rule revisions. The other two operating brotherhoods refused all proffers of arbitration, broke off mediation and announced a strike effective March 11, 1946. This emergency was avoided by appointment by the President of the United States of a fact finding board to investigate and report upon the situation resulting from the demands of these brotherhoods.

The wage demands of the two groups of employees, if granted, would increase this Company's annual payroll by approximately $16,300,000. This estimate does not include increases to any employees in the supervisory or official classes. The rules changes, if granted, in addition to interfering seriously with operation, would increase operating costs greatly in excess of all wage demands.

Employees

The average number of employees during the year was 21,968. Railway Property Investment of $567,302,000 averaged $25,824 per employee. The Company's total payroll for 1945 was $54,734,000, an average of $2,492 per employee. In addition to wages and salaries, the Company paid $3,796,000 for Railroad Retirement and Unemployment Insurance taxes and employee Relief and Pension Funds, which averaged $173 per employee.

The Board expresses to the officers and employees its appreciation of the continued fidelity, diligence and efficiency with which they have served the Company and the Nation during the year.

W. J. JENKS, *President.*

[Advertisement]

Financial News

(Continued from page 790)

$32,638,000, a decrease of 36.84 per cent. Representing 82.49 per cent of all accruals, federal taxes totaled $26,924,000, which included $3,240,000 for railroad retirement and unemployment insurance taxes. Taxes took 23 cents per dollar of operating revenues, and amounted to $23 for each share of common stock, on which N. & W. paid dividends of $13.

Additions and betterments to the railway's property during 1945 included the beginning of construction of large new fireproof merchandise pier facilities at Lambert Point, Va.; construction of a new draw bridge 190 ft. long at Norfolk, Va.; construction of a 180,000 gal. concrete reservoir at Portlock, Va., to provide adequate water supply in connection with handling vegetable shipments; modernization of automatic signals between Williamson and Fort Gay, W. Va., a distance of 47 miles; installation of centralized traffic control between Pulaski and Bristol, Va., showed continuing progress. Passing sidings and team and storage tracks were constructed and extended at numerous strategic points to accommodate increased traffic movements, and new industrial sidings and extensions of existing layouts were constructed at forty-three locations. One hundred miles of track were laid with standard 131-lb. rail, making a total of 3,205 miles of track now laid with 130 or 131-lb. rail.

PEORIA & PEKIN UNION.—*Annual Report.*—Railway operating revenues in 1945 totaled $1,778,686, an increase of $17,772 over 1944 and railway operating expenses totaled $1,531,612, an increase of $16,928. Net income amounted to $31,612, an increase of $23,137.

PERE MARQUETTE.—*Equipment Trusts.*—This road has invited bids by April 25 on $1,300,000 of serial equipment trust certificates of 1946 to finance, in part, the purchase of 100 70-ton steel covered hopper cars, together with the 14 units of de luxe passenger equipment that will compose the Pere Marquette's two modern streamlined trains to be put into service this year. The passenger equipment includes 2 baggage cars, 2 mail and express cars, 4 coaches with lounge, 4 coaches with observation end, and 2 lounge diners. The total cost of the equipment securing the serial certificates will be approximately $1,690,476. No bid for less than 99 per cent of par plus accrued dividends from May 1, 1946, to the date of delivery, will be considered. All bids are to be submitted subject to Interstate Commerce Commission approval of the proposed issue.

PITTSBURG, SHAWMUT & NORTHERN.—*Refinancing.*—This road's receivers have applied to the Interstate Commerce Commission for authority to issue $200,000 of receivers' certificates at an interest rate of 6 per cent a year. Proceeds of the loan, of which $100,000 is sought immediately and the balance as needed, would provide working capital to maintain the road as a going business until a sale can be effected, the application indicated.

SOUTHERN PACIFIC.—*Refunding.*—Division 4 of the Interstate Commerce Commission has authorized the Southern Pacific Railroad to issue, and the Southern Pacific Company to assume liability for, $25,000,000 of series G first mortgage 2¼ per cent bonds, due in 1961, sold at 98.319 to Kuhn, Loeb & Company and others, making the average annual cost to the road 2.38 per cent. The proceeds and other funds are to be applied to the retirement at 101⅝ of an equal principal amount of series A first mortgage 2⅞ per cent bonds, due in 1961, with an estimated reduction in interest and other charges of $1,198,388.

TENNESSEE CENTRAL.—*Annual Report.*—Operating revenues for 1945 amounted to $3,847,985, compared with $4,769,426 in 1944, a decrease of $921,441 or 19.3 per cent. Operating expenses amounted to $3,140,494, as compared with $3,668.396 in the preceding year, a decrease of $527,902 or 14.4 per cent. Net income was $59,110 in 1945, as compared with $149,844 in 1944.

UNION PACIFIC.—*Annual Report.*—Operating revenues of the Union Pacific in 1945 totaled $491,877,872, a decrease of 2.9 per cent under the $506,590,966 reported for 1944. Net income, after taxes and charges, was $33,031,579, compared with $41,070,894, a drop of 19.6 per cent. Operating expenses were $362,286,584, compared with $314,959,801, an increase of 15 per cent, the major part of which was caused by accelerated amortization of defense projects. The interest on the funded debt was reduced to $13,505,867, a 4.3 per cent decrease under the $14,110,071 interest paid in 1944.

Average Prices Stocks and Bonds

	April 9	Last Week	Last Year
Average price of 20 representative railway stocks	63.66	63.27	50.43
Average price of 20 representative railway bonds	102.89	102.95	96.34

Dividends Declared

Belt Railroad & Stockyards Co.—Common, 50¢; 6% preferred, 75¢ both quarterly both payable April 1 to holders of record March 21.

Cleveland, Cincinnati, Chicago & St. Louis.—Preferred, quarterly, $1.25, payable April 30 to holders of record April 19.

Louisville & Nashville.—Quarterly, 88¢, payable June 13 to holders of record May 1.

Minneapolis & St. Louis.—$1.00, payable June 15 to holders of record May 31.

Northern of New Hampshire. — Quarterly, $1.50, payable April 30 to holders of record April 11.

Wheeling & Lake Erie.—(pr.ln.), $1.00; 5½% preferred, $1.37½, both quarterly, both payable May 1 to holders of record April 20.

Wheeling & Lake Erie. — 5½% preferred, $1.37½, and 4% prior lien, both quarterly, both payable May 1 to holders of record April 20.

Abandonments

CHICAGO & NORTH WESTERN.—In a report on rehearing, Division 4 of the Interstate Commerce Commission again has denied this company's application for authority to abandon a 37.69-mile branch from Belle Plaine, Iowa, to What Cheer. Such authority was requested in 1942 and denied the following year (as noted in *Railway Age* of April 3, 1943, page 695), without prejudice to its renewal upon alleviation of the shortage of trucking facilities then current. The renewed application was opposed by the Iowa State Commerce Commission and shippers on various grounds, including the contention that the condition of the roads and of the available trucks is such that hardship would be suffered by the territory served by the branch if it should now be abandoned. The division held that "any loss to the applicant from branch operations would be outweighed by the detriment to the shippers and communities affected." Its denial, however, was without prejudice to a renewal of the application "at some future date, if operations are continued at substantial losses and other means of transportation have substantially improved."

SACRAMENTO NORTHERN.—This road has applied to the Interstate Commerce Commission for authority to abandon a 6,443-ft. line in the streets of Chico, Cal.

SUMPTER VALLEY.—This road has asked the Interstate Commerce Commission for authority to abandon the 57-mile narrow-gage line from South Baker, Ore., to Bates, its intention being to operate bus service instead between those points.

Railway Officers

EXECUTIVE

James S. Thorp, assistant to the vice-president of operations of the Delaware, Lackawanna & Western, has been appointed assistant to the president, with headquarters as before at New York.

F. H. Moore, whose retirement as vice-president of the Kansas City Southern, with headquarters at Kansas City, Mo., was reported in the *Railway Age* of April 6, was born at Mantua, Ohio, on September 1, 1872, and received his higher education at the University of Kansas and at George Washington University, Washington, D. C. He was engaged in the general practice of law until January, 1910, when he entered railroad service as an assistant attorney on the Kansas City Southern, at Kansas City, his headquarters during his entire

F. H. Moore

railroad career. On October 1, 1911, he was promoted to assistant general solicitor, and served in that capacity until June 1, 1920, when he became general solicitor. Mr. Moore was promoted to general counsel on May 20, 1936, and on May 20, 1944, he became vice-president and general counsel of the Kansas City Southern and the Louisiana & Arkansas. On October 1, 1944 he became vice-president of those roads, the position he held at the time of his retirement.

FINANCIAL, LEGAL AND ACCOUNTING

H. L. Pratt, property and tax agent on the Canadian Pacific, at Winnipeg, Man., has been promoted to right of way and tax agent, Western lines, with the same headquarters, succeeding **J. G. Osborne,** deceased.

G. E. Lees, auditor of disbursements on the Northern Pacific, at St. Paul, Minn., has been promoted to assistant general auditor, with the same headquarters, succeeding **F. W. Stetekluh,** whose recent promotion to general auditor was reported in the *Railway Age* of April 6. **P. G. Ramswick,** assistant auditor of disbursements, succeeds Mr. Lees as auditor of disbursements, with headquarters as before at St. Paul.

Mr. Stetekluh was born at Eau Claire, Wis., on March 8, 1888, and entered railway service in June, 1906, as an extra gang timekeeper on the Chicago, St. Paul, Minneapolis & Omaha, later holding various minor positions with that road until February, 1912, when he became a division accountant on the Chicago Great Western at St. Paul. In June, 1918, Mr. Stetekluh was appointed a special accountant of the Minneapolis, St. Paul & Sault Ste. Marie and later in the same year he resigned to go with the Northern Pacific in a similar capacity, with headquarters at St. Paul. In 1920 he was advanced to assistant auditor of disbursements and a short time later to general accountant. On January 1, 1928, Mr. Stetekluh became auditor of disbursements, and on February 15, 1938, he was promoted to assistant general auditor, the position he held at the time of his new appointment.

James B. Fleming, assistant auditor and assistant general freight agent for the Cambria & Indiana, with headquarters at Philadelphia, Pa., has been appointed auditor and general freight agent there, succeeding the late **Clarence R. Smith. Raymond W. Seiling** succeeds Mr. Fleming as assistant auditor and assistant general freight agent.

Windsor F. Cousins, assistant general counsel for the Pennsylvania, has been appointed general attorney, with headquarters as before at Philadelphia, Pa., succeeding **George R. Allen,** who has retired after 30 years of railroad legal work. **William F. Zearfaus,** assistant general solicitor there, succeeds Mr. Cousins as assistant general counsel at Philadelphia.

OPERATING

Harold L. Kimble, whose promotion to superintendent of the Toledo division of the Pennsylvania, with headquarters at Toledo, Ohio, was reported in the *Railway Age* of March 30, was born at Reed Station, Pa., on March 5, 1897, entered rail-

Harold L. Kimble

road service on September 9, 1915, as a clerk on the Sunbury division of the Pennsylvania, and served in various minor positions until February, 1928, when he was appointed relief yardmaster on the Sunbury division. On June 8, 1936, he was transferred to Harrisburg, Pa., and on October 1 of the same year he was appointed yardmaster on the Philadelphia division. Mr. Kimble became assistant trainmaster on the same division on March 1, 1940, and trainmaster on the Erie and Ashtabula division on January 1, 1942. On March 25, 1943, he was appointed night trainmaster on the Philadelphia division, and on June 16, 1945, he was advanced to freight trainmaster on the same division, the position he held at the time of his recent promotion.

Morton S. Smith, whose appointment as superintendent of the Philadelphia division of the Pennsylvania, with headquarters at Harrisburg, Pa., was announced in the April issue of *Railway Age,* was born at Hughesville, Pa., and was graduated from Pennsylvania State College. He entered the service of the Pennsylvania in 1929, as an assistant on the engineer corps, Middle division, at Lancaster, Pa., and in the same year advanced to assistant supervisor of track, serving in that capacity on the Baltimore, Philadelphia, Maryland, and

Morton S. Smith

Middle divisions. In 1933 he was promoted to supervisor of track on the Monongahela division, and until 1939 served in that capacity on various divisions. Mr. Smith was appointed division engineer, Monongahela division, in 1940, then, in February, 1943, transferred to the Long Island, with headquarters at Jamaica, N. Y. In July, 1943, he was named superintendent of the Logansport division of the Pennsylvania at Logansport, Ind., and again advanced in October, 1944, to superintendent of freight transportation, Western region, at Chicago, the post he held until his recent appointment.

J. R. Cantwell, assistant superintendent of the Chicago freight terminals of the Chicago & North Western, has been appointed superintendent of the Black Hills division, with headquarters at Chadron, Neb., succeeding **Harley Thayer,** who has retired. **L. C. Reynolds,** who has been acting superintendent since Mr. Thayer's retirement, returns to his former position as assistant superintendent of the Black Hills division, with headquarters at Casper, Wyo. **F. L. Houx** has been appointed assistant superintendent of the Chicago freight terminals, at Proviso, Ill. **C. A. Hummel** has been appointed assistant

superintendent of the Lake Shore division, at Green Bay, Wis. **George C. Stuart,** recently released from the armed forces, has been appointed assistant superintendent of the Madison division, with headquarters at Adams, Wis. **A. Schmidt** has been appointed trainmaster on the Lake Shore division, at North Fond du Lac, Wis.

C. A. White has been appointed general superintendent of the Tonopah & Goldfield, with headquarters at Tonopah, Nev.

Frank R. Rex, superintendent of the Eastern division of the Pennsylvania with headquarters at Pittsburgh, Pa., has been appointed assistant to the general manager, Central region, at Pittsburgh.

L. O. Todd, assistant to receiver and chief accounting officer of the Georgia & Florida, with headquarters at Augusta, Ga., has been appointed assistant general manager there, also continuing in his capacities as assistant to receiver. The position of chief accounting officer has been abolished.

Marion Streett, superintendent of the Monongahela division of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been transferred to the Erie & Ashtabula division at New Castle, Pa. **W. H. Mapp** has been appointed superintendent of the Monongahela division, succeeding Mr. Streett.

E. E. Rusch has been appointed acting assistant comptroller on the Chicago & North Western, at Chicago. **C. H. O'Hearn** has been appointed acting general auditor of the Chicago, St. Paul, Minneapolis & Omaha (part of the North Western System), with headquarters at St. Paul, Minn., replacing Mr. Rusch.

Burt Foster, trainmaster on the Union Pacific, at Rawlins, Wyo., has been appointed assistant superintendent at Laramie, Wyo., succeeding **C. L. Clark,** who has been transferred to North Platte, Neb., where he replaces **T. F. Shanahan,** who in turn has been transferred to Omaha, Neb. **E. F. Dearden,** assistant chief dispatcher at Green River, Wyo., succeeds Mr. Foster as trainmaster at Rawlins.

K. R. Perry has been appointed assistant division superintendent on the Canadian Pacific, with headquarters at Moose Jaw, Sask., succeeding **W. L. Wilson,** whose promotion to superintendent at Kenora, Ont., was reported in the *Railway Age* of February 9, and whose photograph appeared with a biographical account in the February 23 issue.

Allen J. Greenough, whose promotion to superintendent of freight transportation, Western Region, of the Pennsylvania, with headquarters at Chicago, was reported in the *Railway Age* of April 6, was born at San Francisco, Cal., on September 20, 1905, and received his higher education at Union College, Schenectady, N. Y. He entered railway service with the Pennsylvania on July 1, 1928, as an assistant on the engineering corps of the New York and Philadelphia divisions, later serving as assistant track supervisor, track supervisor and division engineer at various points of the road. On January 15, 1945, Mr. Greenough was promoted to superintendent of the Wilkes-Barre division, the position he held at the time of his new appointment.

TRAFFIC

J. G. Weihofen, foreign freight agent on the Canadian Pacific, at Detroit, Mich., has been transferred to Chicago.

J. M. Alderson, passenger agent on the Canadian Pacific, at Vancouver, B. C., has been promoted to general agent, passenger department, with the same headquarters.

G. A. Remington has been appointed assistant traffic manager on the Chicago & North Western, with headquarters at Omaha, Neb.

A. Poynor has been appointed general agent on the Missouri Pacific, with headquarters at St. Louis, Mo. **J. M. Hrebec** has been appointed assistant general freight agent, also at St. Louis.

Charles W. Mack, whose appointment as general foreign freight agent of the Reading, with headquarters at Philadelphia, Pa., was announced in the *Railway Age* of March 9, was born at Richmond, Pa., on March 30, 1883, and entered railroading in 1901 with the Philadelphia & Reading (now the Reading), serving the Reading continuously ever since. He became agent at White Deer, Pa., in 1903,

Charles W. Mack

chief clerk at Milton, Pa., in 1906, agent at Bloomsburg, Pa., in 1917, then transferred to Trenton, N. J., in 1924. At Trenton he was advanced to general agent in 1929, and in 1936 was promoted to assistant manager of the Port Richmond Terminal at Philadelphia, Pa., where he became manager in 1938. Mr. Mack maintained the latter post until his recent appointment became effective on March 1.

V. L. Pernter has been appointed southern freight agent for the Reading, with headquarters at Atlanta, Ga., and the position of acting southern freight agent abolished.

F. N. Nye has been appointed assistant to general freight traffic manager of the New York Central, with headquarters at New York. **W. J. Hickey** has been named assistant to freight traffic manager there.

E. F. Stone has been appointed general agent of the Norfolk & Western with headquarters at Jacksonville, Fla. **H. J. Fink,** recently returned from military service, has resumed his post as general agent at Philadelphia, Pa., at which point **W. H. Whyte** has been named district freight agent. The positions of acting general agent and soliciting freight agent at Philadelphia have been abolished.

James C. Beene, whose appointment as foreign freight traffic manager of the Reading, with headquarters at Philadelphia, Pa., was announced in the *Railway Age* of March 9, was born at Tullahoma,

James C. Beene

Tenn., on July 3, 1893, and entered railway service in 1923 as a traveling freight agent for the El Paso & Southwestern (now Southern Pacific), in which capacity he joined the Reading in 1925. He became general agent for the Reading in 1926, then division freight agent in 1931, and in 1936 was furloughed to the Pennsylvania-Reading Seashore Lines, returning to the Reading in 1939 as assistant general freight agent. Mr. Beene held the latter post until his recent appointment became effective on March 1.

A. H. Snider, assistant general agent of the Delaware, Lackawanna & Western at Philadelphia, Pa., has been promoted to general agent, with headquarters at San Francisco, Cal., succeeding **W. R. Kneiss,** who has retired.

The Charleston & Western Carolina has named **C. W. Rankin** assistant general freight agent at Augusta, Ga., and **H. Gower, W. E. Carroll,** and **A. W. Jones** general agents at Greenville, S. C., Atlanta, Ga., and Augusta, respectively.

The New York offices of the New York Central's foreign freight traffic department, marine department, and lighterage department will move on April 15 from the Produce Exchange building on lower Broadway to 25 Broadway.

Payton E. Scheppe has been appointed district freight agent for the Illinois Central, with headquarters at Miami, Fla., succeeding **J. C. Cook,** who has been transferred. **A. D. Denis** has been named traffic service agent at Washington, D. C.

H. L. Sweeney, traveling passenger agent on the Louisville & Nashville, at Biloxi, Miss., has been appointed district passenger agent at Houston, Tex. **John I. Zempke,** traveling passenger agent at Cincinnati, Ohio, has been appointed district passenger agent at Cleveland, Ohio.

E. G. Jones, city passenger agent at Louisville, Ky., has been appointed district passenger agent with the same headquarters. **H. C. Bretney,** passenger agent at Jacksonville, Fla., has been appointed general agent, passenger department, with the same headquarters. **Tyndall Ball** has been appointed district passenger agent at Detroit, Mich. **J. W. Chaney,** traveling passenger agent, has been appointed district passenger agent, with headquarters as before at Miami, Fla.

ENGINEERING & SIGNALING

B. H. Crosland, whose appointment as assistant chief engineer on the St. Louis-San Francisco, with headquarters at Springfield, Mo., was reported in the *Railway Age* of March 23, was born at Rochester, N. Y., on July 9, 1891, and received his higher education at Valparaiso University. He entered railroad service during school vacation in 1908, as a chainman with the Canadian Pacific, and served during subsequent summers as chainman and rodman on the Buffalo, Rochester & Pittsburgh (now part of the Baltimore & Ohio)

B. H. Crosland

and the New York State (now abandoned). From 1914 to 1917 he was an instrumentman on railway valuation for the Interstate Commerce Commission. Released from the armed forces in 1919, Mr. Crosland returned to the I. C. C. as senior civil engineer on railway valuation. In 1920 he entered the service of the St. Louis-San Francisco as an instrumentman, and served subsequently as assistant engineer, roadmaster, assistant division engineer, and division engineer, until 1942, when he entered the service of the armed forces, in which he attained the rank of colonel.

Edward Lockhart, whose appointment as superintendent of telegraph and signals of the Virginian, with headquarters at Princeton, W. Va., was announced in the March 30 issue of *Railway Age,* was born at Wheatland, N. D., on December 28, 1900, and entered railroading with the Great Northern as a crew caller in May, 1918, being promoted to yard clerk in September, 1918, and to leverman-operator on the Breckenridge division in December of the same year. From September, 1919, to October, 1921, Mr. Lockhart served as radioman in the United States Navy. He returned to the Great Northern as a leverman-operator in October, 1921, and in March, 1923, he was advanced to signalman of the Wilmar division. From September, 1923, to March, 1924, he worked in the construction department of the Federal Signal Company, and then he went with the construction department of the Gen-

Edward Lockhart

eral Railway Signal Company, where he remained until July, 1928, when he was employed by the Southern as signal foreman of the Memphis division, being transferred to the Knoxville division in June, 1931. In April, 1937, he entered the services of the Virginia Central on crossing signal installations. Mr. Lockhart went with the Virginian in September, 1937, as signal supervisor, and was advanced to assistant superintendent telegraph and signals on October 1, 1941, which position he held at the time of his recent promotion to superintendent of telegraph and signals.

J. M. MacBride, assistant engineer for the Canadian Pacific, has been appointed assistant engineer of track, with headquarters at Montreal, Que.

R. E. Nottingham, assistant engineer on the Louisville & Nashville, at Louisville, Ky., has been promoted to division engineer, with headquarters at Nashville, Tenn., succeeding **A. T. Kinne,** who has resigned.

John J. Clutz, formerly an engineer with the Washington Terminal, and recently returned from military service, has been appointed division engineer in the office of the chief engineer, Eastern region of the Pennsylvania, with headquarters at Philadelphia, Pa.

R. L. McDaniel has been appointed assistant division engineer on the Atchison, Topeka & Santa Fe, with headquarters at San Bernardino, Cal., replacing **L. C. Post,** assigned to other duties. The position of assistant division engineer at San Diego, Cal., formerly held by **N. A. Richards,** has been abolished.

H. A. Aalberg, assistant chief engineer on the Chicago, Burlington & Quincy, Western lines, at Lincoln, Neb., has been promoted to assistant chief engineer of the Burlington system, including the Colorado & Southern, the Ft. Worth & Denver City, and the Wichita Valley, with headquarters at Chicago, succeeding **G. A. Haggander,** who has retired. **Chauncey C. Robnett,** hydraulic engineer, at Chicago, has been promoted to assistant chief engineer, Western lines, at Lincoln, replacing Mr. Aalberg.

Mr. Robnett was born at Centralia, Ill., on June 22, 1889, and entered railway service in 1910 as a rodman on the Burlington. From 1910 until 1918 he served as rodman and instrumentman at various points on the Illinois and Missouri districts, being promoted to assistant division engineer at St. Joseph, Mo., in the latter year. In 1938 he was further advanced to division engineer at Hannibal, Mo., and in 1942 he was transferred in the same capacity to St. Joseph. In October, 1945 he was advanced to hydraulic engineer, with headquarters at Chicago, the position he held at the time of his recent promotion.

Mr. Haggander was born at Sioux City, Iowa, on January 30, 1885, and was graduated from the Armour Institute of Technology. He entered railway service in 1905 as a draftsman in the office of the bridge engineer of the Burlington, later serving as a concrete inspector and a designer. On June 10, 1910, he was promoted

Chauncey C. Robnett

to office engineer and two years later he was advanced to assistant bridge engineer of the lines East of the Missouri river, with headquarters at Chicago. Mr. Haggander was promoted to bridge engineer of the Burlington system in 1916, with headquarters as before at Chicago, and in December, 1938, his jurisdiction was extended to include the Colorado & Southern and Ft. Worth & Denver City. In May, 1939, he was promoted to assistant chief engineer, and in 1943 his jurisdiction was enlarged to include the whole Burlington System.

R. A. Emerson, assistant district engineer on the Canadian Pacific, at Vancouver, B. C., has been promoted to district engineer, with the same headquarters, succeeding **Thomas Lees,** who has retired. **T. W. Creighton,** division engineer at Revelstoke, B. C., succeeds Mr. Emerson as assistant district engineer at Vancouver. **V. H. Carruthers,** division engineer at Edmonton, Alta., has been transferred to

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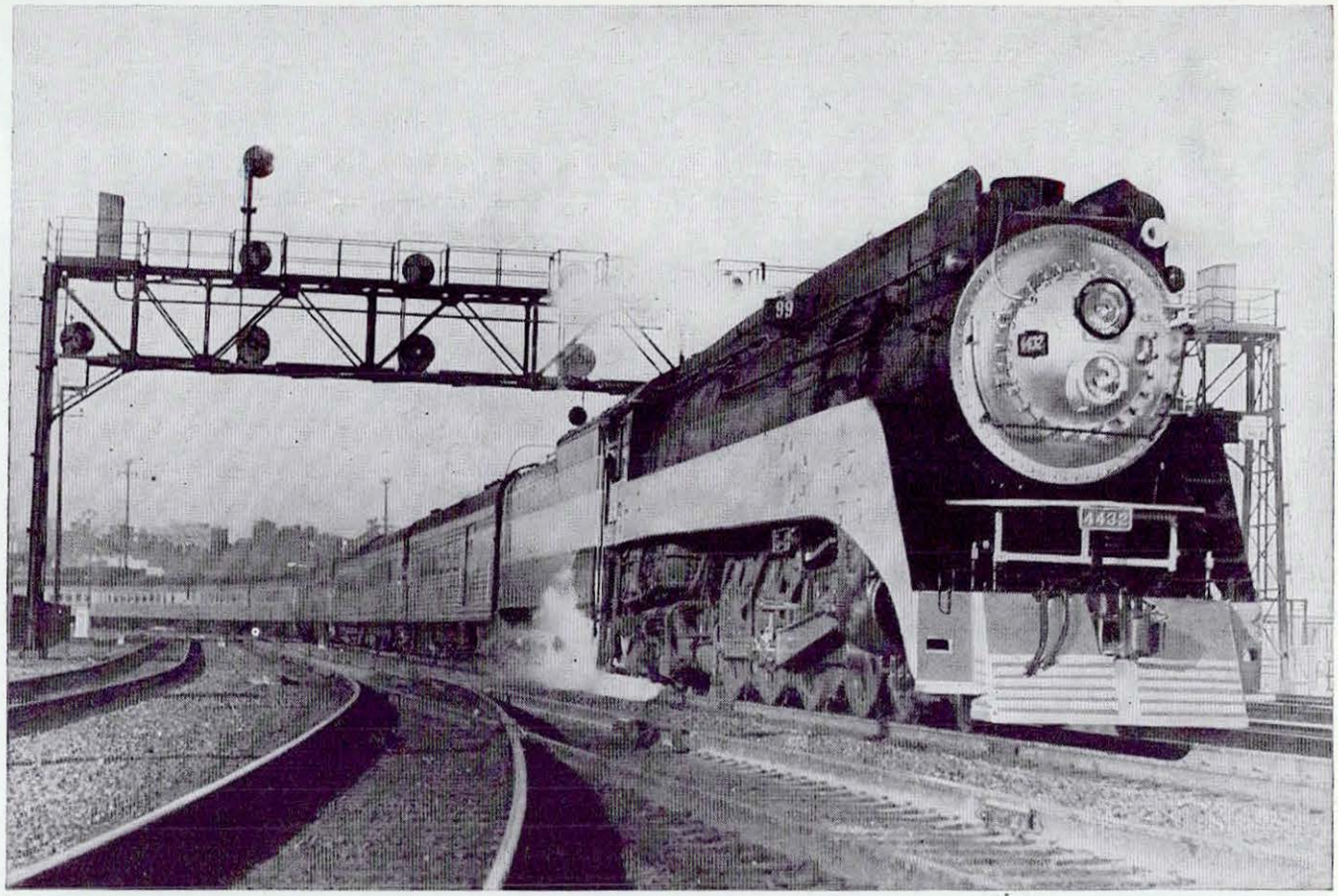

BACK OF THE RECORDS

● In the remarkable traffic records made by American railroads in recent years, modern motive power has played a vital role.

For example, the Southern Pacific's 4-8-4 Lima-built steam locomotives, first designed to power the famous *Daylights,* speed fast and heavy freight trains with equal efficiency.

As the fleet of these giants was increased to sixty, their power and adaptability have proved a mighty factor in enabling the Southern Pacific to handle its unprecedented volume of passenger and freight traffic.

The 1945 ton-miles of freight nearly trebled the 1939 ton-miles, and toward the close of 1945 Southern Pacific's passenger traffic was about six times the prewar passenger miles.

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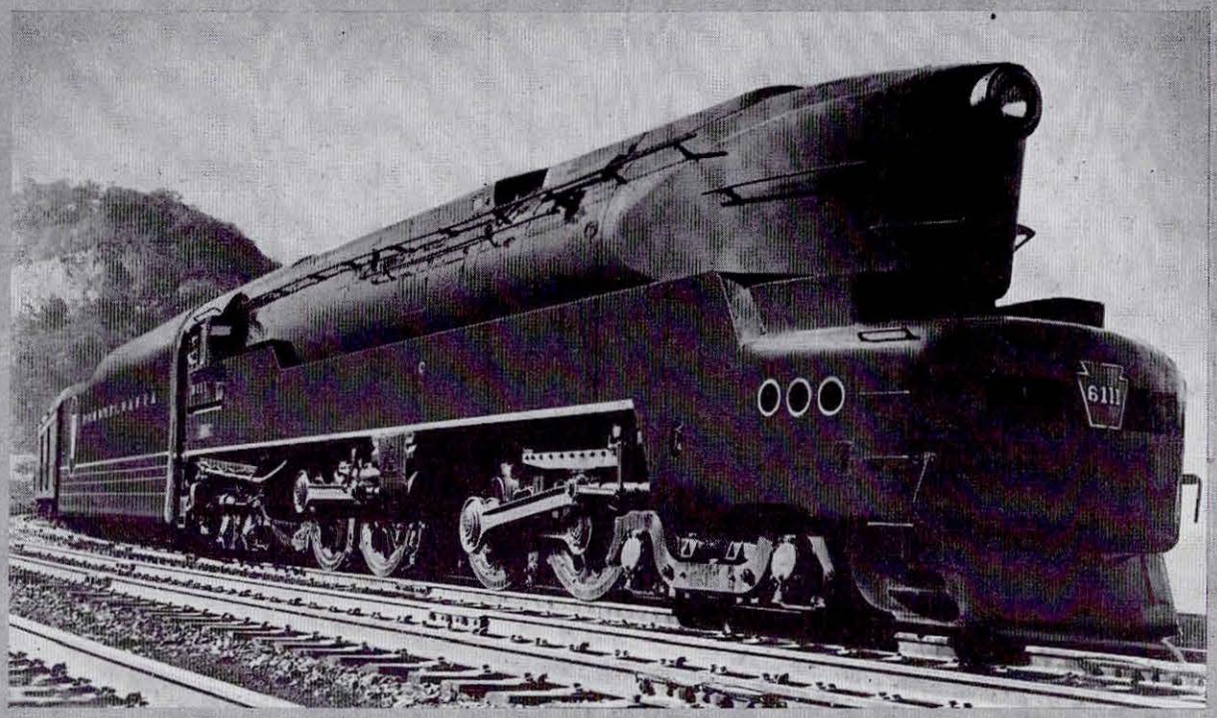
FRANKLIN EQUIPMENT ON



Equipped with The Franklin System of Steam Distribution

The fifty-two Class T-1 locomotives of the Pennsylvania Railroad are equipped with The Franklin System of Steam Distribution. The T-1 has 40 percent higher maximum indicated horsepower than any locomotive previously tested at the Pennsylvania's Altoona test plant.

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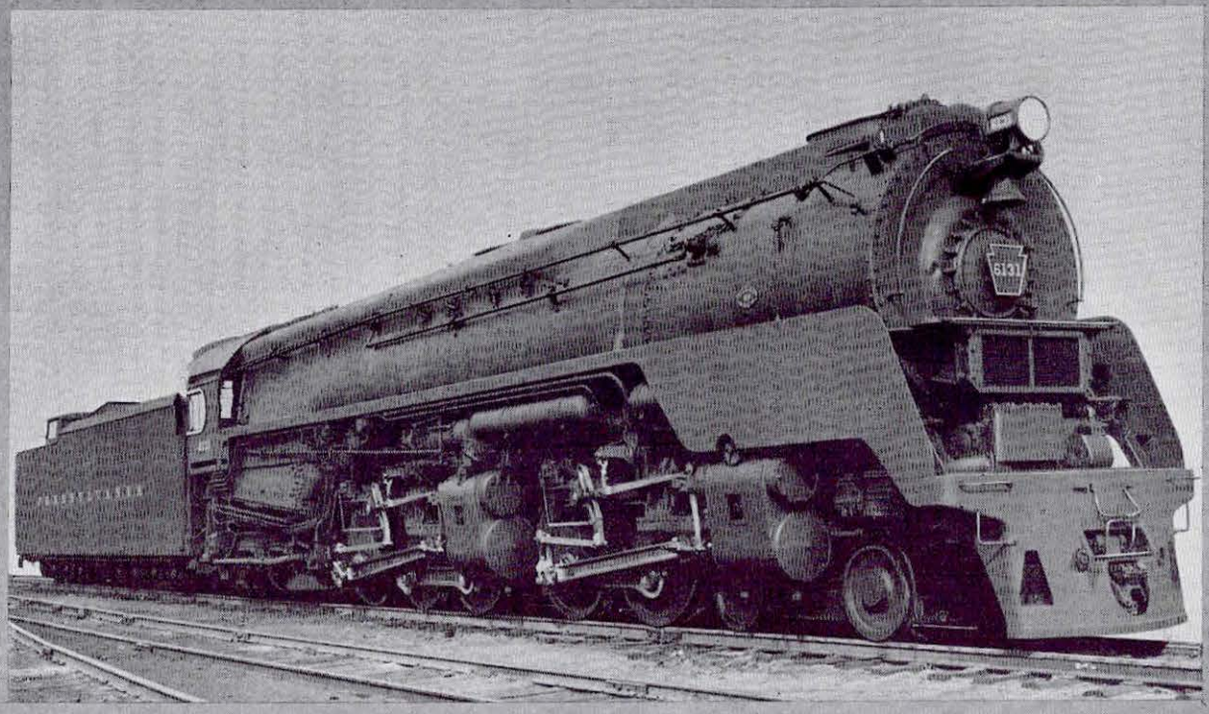


Equipped with the Locomotive Booster*

The twenty-six, 4-4-6-4, non-articulated Class Q-2 steam locomotives, that the Pennsylvania has placed in service for fast and heavy freight operation, are equipped with Locomotive Boosters. They develop a rated tractive force, with the Booster, of 115,800 pounds.

*Trade Mark Reg. U. S. Pat. Off.

STEAM DISTRIBUTION SYSTEM • BOOSTER • RADIAL BUFFER • COMPENSATOR AND SNUBBER • POWER REVERSE GEARS
AUTOMATIC FIRE DOORS • DRIVING BOX LUBRICATORS • STEAM GRATE SHAKERS • FLEXIBLE JOINTS • CAR CONNECTION

Revelstoke, where he replaces Mr. Creighton.

O. A. C. Thorsen, assistant chief engineer of the New York, Susquehanna & Western, has been appointed chief engineer, with headquarters as before at Paterson, N. J., relieving **F. C. Kronauer** of the responsibilities of that office so that he may devote his time to his duties as general manager in charge of operations. Mr. Kronauer's appointment as general manager was noted in the July 21, 1945, issue of *Railway Age.*

MECHANICAL

M. I. Comstock has been appointed master car builder on the Alaska Railroad, with headquarters at Anchorage, Alaska.

B. D. Fessenden, superintendent of mechanical equipment on the Canadian Pacific, at Strathmore, Alta., has retired.

Frank W. Taylor, whose promotion to superintendent of motive power, eastern district, of the Northern Pacific, with headquarters at St. Paul, Minn., was reported in the *Railway Age* of March 30, was born at Oakes, N. D., on October 14, 1888, and entered railway service in February, 1905, as an apprentice on the Northern Pacific at Livingston, Mont. He subsequently served as a machinist, night foreman, assistant enginehouse foreman and enginehouse foreman, with the same headquarters until 1931 when he was transferred to Mandan, N. D. Mr. Taylor later was transferred to Missoula, Mont., and Seattle, Wash. In 1934 he was advanced to general foreman at St. Paul, and in 1940 he was promoted to master mechanic, with headquarters at Glendive, Mont. In 1944 he was advanced to assistant superintendent of motive power at St. Paul, the position he held at the time of his new appointment.

Arthur H. Fiedler, whose promotion to superintendent of motive power on the Northern Pacific, with headquarters at

Arthur H. Fiedler

Seattle, Wash., was reported in the *Railway Age* of March 30, was born at Fargo, N. D., on January 24, 1884, and entered railroad service on June 3, 1903, as a clerk on the Northern Pacific at Fargo. On September 22, 1904, he became a locomotive fireman, and three years later he was promoted to locomotive engineer, in which capacity he served until May 1, 1934, when he became road foreman of engines at Jamestown, N. D., being transferred to Livingston, Mont., on March 1, 1938. Mr. Fiedler was appointed master mechanic at Jamestown on February 1, 1939, and was promoted to general master mechanic at St. Paul, Minn., on March 1, 1941. On January 1, 1944, he was advanced to assistant superintendent of motive power at Seattle, the position he held at the time of his recent promotion.

Virgil R. Hasty, assistant electrical engineer on the Union Pacific, has been appointed electrical engineer, with headquarters as before at Omaha, Neb.

Frank K. Mitchell, whose appointment as general superintendent, motive power and rolling stock, of the New York Central at New York, was announced in the April 6 issue of *Railway Age,* was born at Indianapolis, Ind., on November 17, 1894, and was graduated from Purdue University (B. S. in E. E., 1917, E. E., 1923). After service as a lieutenant in the United States Army overseas during World War I, he entered railway service in December, 1918, as electrician for the Cleveland, Cincinnati, Chicago & St. Louis, advancing to drafts-

Frank K. Mitchell

man in 1919 and to service test engineer in 1922. Mr. Mitchell was promoted to assistant to superintendent motive power in 1923, then became master mechanic in 1932, in which capacity he went to the Indianapolis Union in 1936, returning to the C. C. C. & St. L. in 1938 as assistant superintendent of equipment. In 1940, he was appointed assistant general superintendent, motive power and rolling stock, with headquarters at New York, for the New York Central, the C. C. C. & St. L., and the Michigan Central, and maintained this position until his advancement on April 1.

SPECIAL

A. E. Davis has been appointed superintendent of safety of the Chicago, Burlington & Quincy, with headquarters at Chicago, succeeding **P. F. Buckle,** who has been transferred to the law department as special representative at Denver, Colo.

OBITUARY

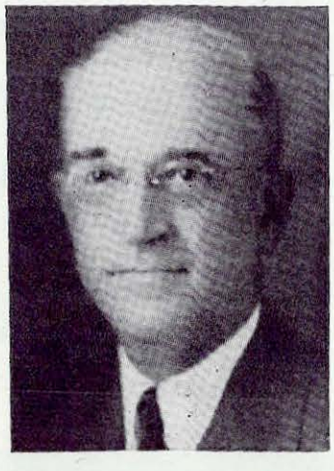
Howard Fletcher, who retired from the service of the Northern Pacific as assistant general passenger agent at New York in 1942, after a 40-year career in railroading, died at his home in Mount Vernon, N. Y., on March 17.

S. M. Andrews, retired district freight agent on the Canadian Pacific, died recently at Vancouver, B. C.

William F. Eberhardt, auditor of receipts on the Illinois Central, with headquarters at Chicago, died in a hospital in that city on April 9.

C. P. Kahler, general electrical engineer of the Union Pacific, with headquarters at Omaha, Neb., died in a hospital at Santa Ana, Cal., recently.

Morris Seymour Hawkins, president of the Norfolk Southern and the Norfolk & Portsmouth Belt Line, whose death on March 14 was reported in the March 23 issue of *Railway Age,* was born on January 21, 1882, at Norfolk, Va., and entered railway service in 1898 as a clerk in the office of the general agent of the Southern at Norfolk, where he advanced through various clerical positions including chief clerk to general agent and to superintendent. He went with the Norfolk Southern as secretary in 1910, and was promoted to assistant to president and secretary in 1912. In 1918, Mr. Hawkins became assistant to federal manager of the Norfolk Southern and of the Virginian, then, during 1919 and 1920, was federal manager of the Norfolk-Southern, the Kinston-Carolina, and the Carolina (operation of the latter two has now been discontinued). From 1920 until 1933, he was assistant to president and secretary of the Norfolk Southern and secretary of the Kinston-Carolina and the Carolina. In 1933, he was appointed co-receiver of the Norfolk Southern, then



Morris Seymour Hawkins

elected president of the line in 1942, at the close of the receivership. Since 1937 Mr. Hawkins had also been serving as president and director of the Norfolk & Portsmouth Belt Line and as director of the Norfolk Terminal.

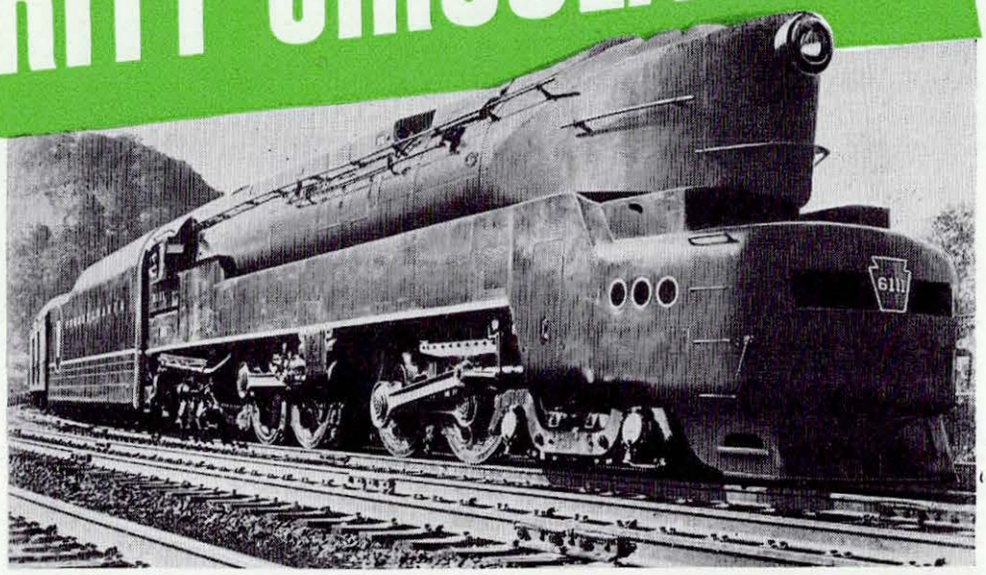
REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1946

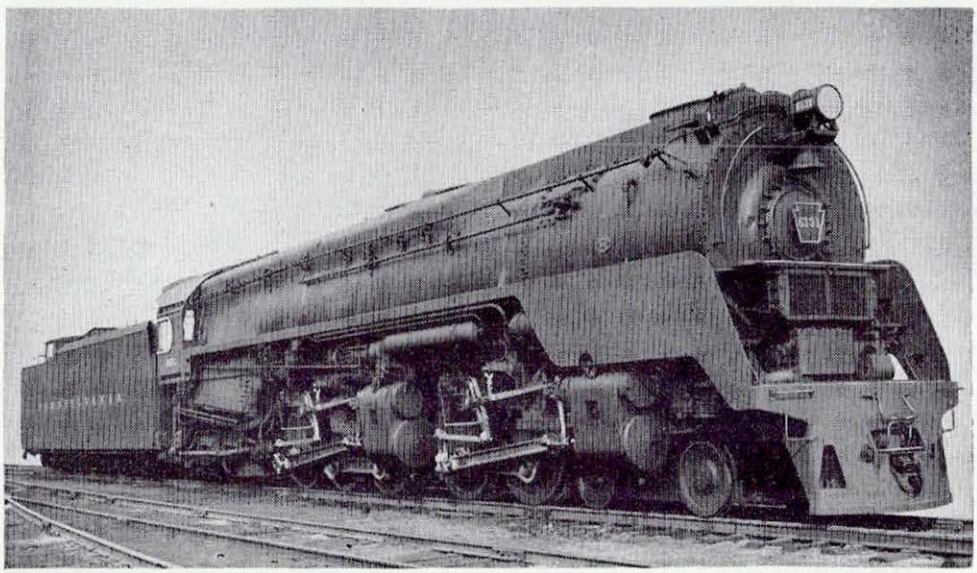
Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income: 1946	1945
Akron, Canton & Youngstown	Feb.	171	$278,791	$98	$295,201	$52,237	$34,657	$24,695	$100,643	$230,489	78.1	$64,712	$22,242	$28,643	$66,672
	2 mos.	171	583,305	293	616,751	106,735	72,053	44,192	208,854	468,087	75.9	148,664	53,008	66,551	143,586
Alton	Feb.	959	1,343,191	672,398	2,329,911	276,928	432,021	73,220	924,662	1,835,884	78.8	494,027	161,050	182,691	377,199
	2 mos.	959	2,773,041	1,372,127	4,766,021	622,929	883,003	140,108	1,947,672	3,853,270	80.8	912,751	328,922	354,950	588,839
Atchison, Topeka & Santa Fe System	Feb.	13,085	21,540,740	7,415,254	31,187,580	4,202,692	5,853,276	643,543	10,068,384	21,429,231	68.7	9,758,349	4,595,008	5,111,016	4,532,573
	2 mos.	13,085	45,232,480	17,315,195	67,413,369	8,589,424	11,702,931	1,283,210	21,838,758	44,731,460	66.4	22,681,909	10,691,779	11,724,836	9,360,655
Atlanta & West Point	Feb.	93	179,705	90,659	304,702	49,360	46,904	11,070	140,644	267,331	87.7	37,371	6,871	11,536	29,234
	2 mos.	93	365,809	190,242	630,554	92,098	98,224	23,559	314,056	568,516	90.2	62,038	5,793	18,582	60,577
Western of Alabama	Feb.	133	182,476	97,658	308,267	71,889	42,691	10,739	125,788	269,191	87.3	39,076	12,556	25,728	37,151
	2 mos.	133	376,890	210,425	646,310	131,669	103,868	22,522	273,266	569,193	88.1	77,117	29,529	50,073	79,196
Atlanta, Birmingham & Coast	Feb.	Included in Atlantic Coast Line.													
	2 mos.														
Atlantic Coast Line	Feb.	5,569	7,348,801	3,001,703	11,075,691	2,360,880	1,664,868	239,624	3,952,359	8,646,774	78.1	2,428,917	1,100,000	969,349	957,472
	2 mos.	5,569	14,775,258	6,058,519	22,388,337	4,690,491	3,574,081	479,915	8,075,868	17,710,592	79.1	4,677,745	2,100,000	1,887,268	1,944,734
Charleston & Western Carolina	Feb.	343	278,248	4,265	290,961	70,987	65,197	9,786	113,367	264,653	91.0	26,308	20,000	5,972	43,865
	2 mos.	343	545,596	14,843	578,124	153,992	130,943	20,732	238,093	555,680	96.1	22,444	40,000	—20,552	91,034
Baltimore & Ohio	Feb.	6,139	17,770,272	3,520,631	22,612,968	3,367,178	5,290,960	543,665	9,623,289	19,859,995	87.8	2,752,973	1,524,661	785,764	3,380,746
	2 mos.	6,139	37,641,939	7,714,784	48,139,185	6,872,254	11,538,258	993,788	20,443,250	42,082,127	87.4	6,057,058	3,113,617	2,043,968	6,800,264
Staten Island Rapid Transit	Feb.	29	173,142	100,707	286,059	72,375	33,822	1,183	136,319	263,211	92.0	22,848	36,396	—32,167	58,718
	2 mos.	29	295,800	216,536	536,154	111,277	72,550	3,142	282,156	510,253	95.2	25,901	72,886	—85,660	126,575
Bangor & Aroostook	Feb.	602	963,908	56,280	1,043,896	217,991	176,116	6,488	320,506	755,056	72.3	288,840	126,330	140,700	128,426
	2 mos.	602	2,126,661	114,561	2,293,436	428,974	370,677	12,314	672,858	1,554,688	67.8	738,748	309,366	376,149	264,576
Bessemer & Lake Erie	Feb.	214	481,063	1,781	492,037	109,600	348,882	13,340	236,438	754,134	153.3	—262,097	46,478	—21,769	14,378
	2 mos.	214	1,029,539	3,649	1,053,471	214,150	714,845	25,986	473,803	1,516,044	143.9	—462,573	93,265	36,643	—221,798
Boston & Maine	Feb.	1,764	4,046,155	1,471,845	6,014,768	937,223	967,021	114,633	2,522,028	4,776,376	79.4	1,238,392	507,409	427,569	382,061
	2 mos.	1,764	8,426,707	2,884,217	12,348,810	1,950,246	1,963,223	194,366	5,159,761	9,764,926	79.1	2,583,884	1,092,618	916,941	524,820
Burlington, Rock Island	Feb.	228	179,429	63,124	261,584	33,506	34,841	3,462	81,029	168,225	64.3	93,359	8,594	40,781	10,625
	2 mos.	228	340,246	125,190	507,041	65,982	59,312	6,872	175,809	340,187	67.1	166,854	17,742	62,512	50,779
Cambria & Indiana	Feb.	35	147,387	.....	147,440	8,620	46,734	593	19,774	82,440	55.9	65,000	68,081	84,566	51,233
	2 mos.	35	298,417	.....	298,527	18,116	95,129	1,224	41,029	170,256	57.0	128,271	138,062	171,861	99,095
Canadian Pacific Lines in Maine	Feb.	234	479,964	48,178	556,235	32,409	72,619	9,104	204,159	332,121	59.7	224,114	24,309	124,277	54,796
	2 mos.	234	966,375	145,392	1,175,100	93,648	163,057	16,098	424,681	722,798	61.5	452,302	47,522	227,434	222,106
Canadian Pacific Lines in Vermont	Feb.	90	101,970	19,613	136,796	37,895	30,911	3,362	117,636	195,274	142.7	—58,478	11,932	—109,967	—133,633
	2 mos.	90	187,589	39,321	262,892	64,750	66,430	5,892	237,354	384,898	146.4	—122,006	21,322	—222,018	—258,964
Central of Georgia	Feb.	1,815	1,885,956	519,198	2,664,631	468,123	461,007	85,272	1,246,052	2,414,754	90.6	249,877	187,852	83,910	406,727
	2 mos.	1,815	3,790,084	1,103,393	5,445,191	913,101	925,783	170,151	2,450,577	4,757,606	87.4	687,585	379,828	346,086	918,740
Central of New Jersey	Feb.	649	2,787,294	532,787	3,562,844	481,735	744,492	58,469	1,949,064	3,411,003	95.7	151,841	415,804	—415,986	454,205
	2 mos.	649	5,870,015	1,097,766	7,533,263	960,847	1,586,506	123,899	4,023,316	7,065,707	93.8	467,556	799,475	—609,644	589,197
Central Vermont	Feb.	422	546,491	84,000	673,549	99,904	119,717	10,066	321,395	576,787	85.6	96,762	42,728	—8,213	57,814
	2 mos.	422	1,041,863	174,000	1,310,486	192,118	236,652	19,832	682,354	1,183,156	90.3	127,330	84,450	—75,411	—63,862
Chesapeake & Ohio	Feb.	3,084	14,248,346	1,337,517	16,065,661	2,159,416	2,749,534	273,365	4,603,757	10,299,511	64.1	5,766,150	2,864,819	3,644,146	2,704,242
	2 mos.	3,084	28,427,190	3,145,414	32,591,966	4,558,131	5,398,895	529,067	9,542,490	21,104,376	64.8	11,487,590	5,738,248	7,267,880	5,220,204
Chicago & Eastern Illinois	Feb.	910	1,291,909	374,863	1,856,378	291,660	482,685	68,597	815,488	1,761,030	94.9	95,348	129,200	—127,695	212,488
	2 mos.	910	2,716,164	855,616	3,981,176	612,718	945,405	140,029	1,694,458	3,606,589	90.6	374,587	262,400	—97,821	415,440
Chicago & Illinois Midland	Feb.	131	445,489	945	468,088	40,435	80,314	22,387	145,746	316,971	67.7	151,117	67,913	78,177	68,229
	2 mos.	131	928,847	1,910	972,171	86,064	184,066	50,987	301,008	677,472	69.7	294,699	134,934	155,391	138,910
Chicago & North Western	Feb.	8,072	7,843,751	2,689,943	11,872,718	1,865,009	2,361,661	228,980	5,100,002	10,086,963	85.0	1,785,755	826,551	631,921	1,436,065
	2 mos.	8,065	15,944,592	6,038,680	24,816,462	3,771,272	5,052,981	464,512	10,621,930	20,996,492	84.6	3,819,970	1,758,688	1,486,217	2,962,591
Chicago, Burlington & Quincy	Feb.	8,863	12,811,553	2,430,466	16,742,450	2,038,575	1,956,564	293,909	5,197,767	10,029,110	59.9	6,713,340	2,891,924	3,468,326	2,634,288
	2 mos.	8,863	26,248,571	7,069,022	36,648,979	3,970,453	4,127,195	565,433	10,670,240	20,494,621	55.9	16,154,358	6,710,355	8,662,945	6,334,000
Chicago Great Western	Feb.	1,500	1,772,485	229,201	2,213,050	423,313	338,964	68,045	999,983	1,881,765	85.0	331,285	134,103	—43,033	227,634
	2 mos.	1,500	3,636,842	465,994	4,552,368	859,726	683,068	143,071	2,080,971	3,896,381	85.6	655,987	271,962	—76,829	464,197
Chicago, Indianapolis & Louisville	Feb.	541	658,042	45,252	743,988	85,705	157,192	32,321	308,550	624,669	84.0	119,319	51,701	1,087	242,734
	2 mos.	541	1,342,213	107,670	1,538,948	174,213	324,515	64,133	634,902	1,284,148	83.4	254,800	105,748	19,716	470,381

(Table continued on second left-hand page)

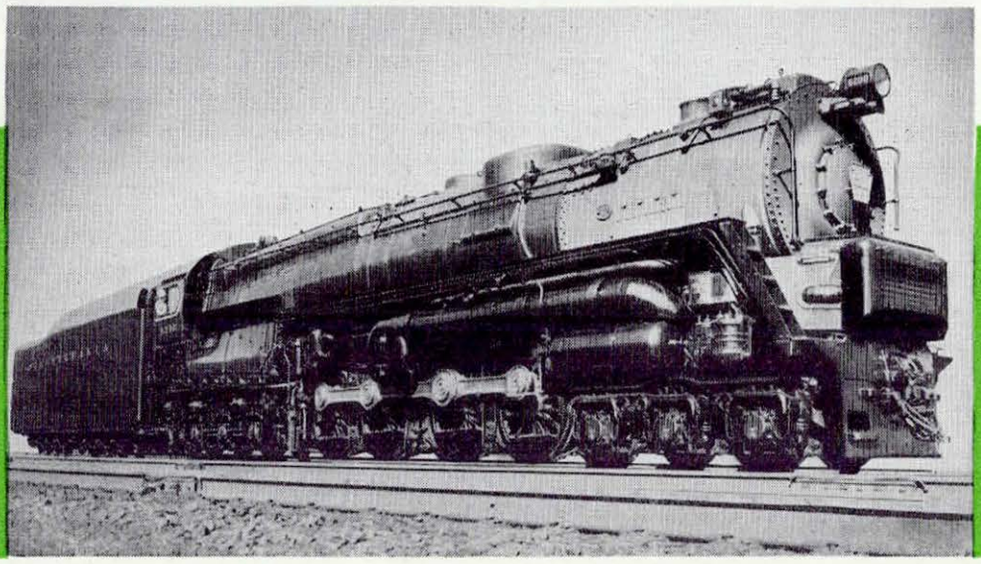
SECURITY CIRCULATORS



The Pennsylvania Railroad's new T-1 locomotive is "powered for fleetness." Capable of 100-mile an hour speed, this streamlined giant is designed to haul heavy passenger trains on fast, sustained schedules, and for swift freight service.



The Pennsylvania Railroad's Q-2 locomotive has been designed to develop more power in its working range — at speeds over 20 miles an hour — than any steam locomotive previously built. It can haul 125 loaded freight cars faster than 50 miles an hour.



The Pennsylvania Railroad's S-2 is a fundamentally new, turbine-driven, all-purpose locomotive. It is powered for 100-mile an hour speeds with full-length passenger trains, and for high speeds with freight.

important contribution

to Modern Locomotive Design

That Security Circulators are recognized as an important contribution to modern locomotive design is illustrated by their incorporation in each of these three types of Pennsylvania locomotives.

Security Circulator equipped locomotives are available for continuous operation for longer periods than other locomotives, because of the improved life of the arch.

With Security Circulators circulation is improved in side-water-legs and over crown sheets.

The installation of Security Circulators also permits the use of a 100% arch in any type of locomotive firebox and increases the life of the arch brick.

American Arch Company, Inc.

SECURITY CIRCULATOR DIVISION

NEW YORK • CHICAGO

REVENUES AND EXPENSES OF RAILWAYS

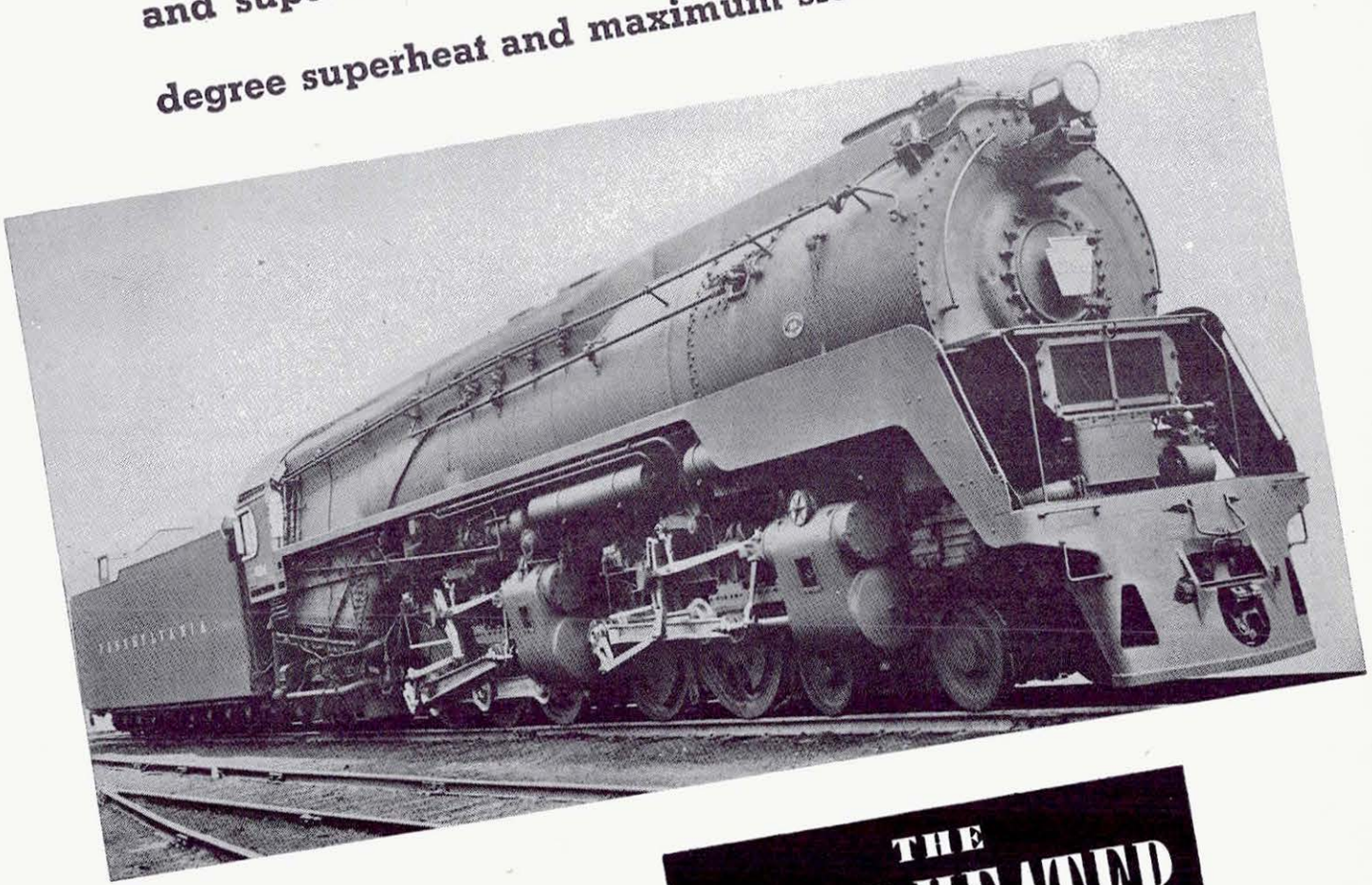
MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1946

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income: 1946	1945
Chicago, Milwaukee, St. Paul & Pacific	Feb.	10,733	$11,005,704	$2,419,316	$14,936,625	$2,066,751	$2,764,141	$293,765	$6,707,212	$12,505,750	83.7	$2,430,920	$761,000	$1,201,252	$2,492,516
	2 mos.	10,733	23,842,021	5,967,214	33,101,422	4,172,279	5,724,340	562,805	13,879,653	25,771,610	77.9	7,329,812	2,885,000	3,405,240	5,031,051
Chicago, Rock Island & Pacific	Feb.	7,652	8,953,997	2,597,076	12,541,451	1,484,581	2,079,662	342,420	4,510,214	9,007,833	71.8	3,533,618	1,404,873	1,353,565	1,871,716
	2 mos.	7,654	18,681,761	6,005,721	26,918,243	3,062,728	4,251,267	710,598	9,530,931	18,794,587	69.8	8,123,656	2,765,862	3,914,320	4,193,838
Chicago, St. Paul, Minneapolis & Omaha	Feb.	1,616	1,567,874	233,453	1,991,046	332,801	341,252	42,253	1,060,118	1,860,811	93.5	130,235	144,721	—207,942	248,759
	2 mos.	1,616	3,286,417	554,004	4,242,091	660,711	700,788	84,413	2,195,034	3,811,923	89.9	430,168	298,458	—201,625	462,470
Clinchfield	Feb.	302	1,180,651	7,679	1,198,635	82,437	157,359	21,688	289,936	572,014	47.7	626,621	134,846	511,954	533,598
	2 mos.	302	2,219,260	16,221	2,256,508	179,988	308,236	45,083	592,247	1,167,986	51.8	1,088,522	269,882	867,883	1,069,656
Colorado & Southern	Feb.	748	544,888	216,415	843,301	181,498	155,529	19,808	328,882	728,406	86.4	114,895	67,182	33,628	146,279
	2 mos.	748	1,157,756	440,865	1,782,429	355,065	333,111	37,632	708,476	1,524,300	85.5	258,129	137,704	80,002	322,658
Fort Worth & Denver City	Feb.	902	499,202	302,837	890,172	165,518	173,355	28,157	290,808	712,714	80.1	177,458	84,815	81,352	166,021
	2 mos.	902	1,049,256	674,231	1,916,819	354,737	320,228	55,954	623,078	1,468,915	76.6	447,904	206,057	209,118	282,136
Colorado & Wyoming	Feb.	42	3,637	—	27,318	4,639	11,001	730	11,539	33,795	123.7	—6,477	10,046	—28,580	16,900
	2 mos.	42	69,239	—	128,461	13,179	25,783	1,454	46,175	97,643	76.0	30,818	29,751	—11,836	45,648
Columbus & Greenville	Feb.	168	118,843	6,304	136,810	29,788	20,765	4,489	44,528	114,178	83.5	22,632	15,535	7,168	17,428
	2 mos.	168	235,983	13,480	270,239	57,463	43,494	10,047	93,869	234,280	86.7	35,959	28,994	7,877	38,610
Delaware & Hudson	Feb.	846	3,190,507	136,085	3,400,411	414,563	786,460	51,015	1,365,127	2,738,144	80.5	662,267	319,889	360,735	238,789
	2 mos.	846	6,558,233	322,854	7,048,212	851,213	1,622,617	100,655	2,798,174	5,619,129	79.7	1,429,083	689,482	783,384	548,386
Delaware, Lackawanna & Western	Feb.	973	3,682,174	860,234	5,022,087	538,009	859,613	114,177	2,340,720	4,037,090	80.4	984,997	480,082	493,630	3,220
	2 mos.	973	7,801,332	1,768,756	10,565,171	1,079,746	1,812,505	232,008	4,947,125	8,444,392	79.9	2,120,779	1,018,982	1,061,556	—153,323
Denver & Rio Grande Western	Feb.	2,386	2,939,856	1,008,117	4,160,915	403,655	828,775	98,739	1,549,099	3,073,622	73.9	1,087,293	362,367	697,682	991,528
	2 mos.	2,386	6,146,325	2,317,550	8,932,983	868,157	1,800,583	204,095	3,406,465	6,687,408	74.9	2,245,495	719,117	1,402,929	2,004,192
Denver & Salt Lake	Feb.	232	273,685	8,773	293,306	48,255	54,670	3,645	114,674	234,369	79.9	58,937	30,948	65,735	72,838
	2 mos.	232	582,260	18,822	624,368	93,333	113,051	7,396	245,988	486,438	77.9	137,930	62,608	152,157	164,055
Detroit & Mackinac	Feb.	230	72,402	3,440	81,346	15,035	14,251	474	33,964	67,815	83.4	13,531	4,224	2,929	—1,957
	2 mos.	230	163,775	8,231	184,944	29,320	29,381	1,419	69,007	137,867	74.5	47,077	8,485	25,760	—1,373
Detroit & Toledo Shore Line	Feb.	50	367,002	—	367,879	25,709	33,556	9,444	112,510	189,823	51.6	178,056	56,870	54,440	61,055
	2 mos.	50	727,824	—	730,475	56,589	59,081	18,868	224,636	376,406	51.5	354,069	116,748	106,909	123,920
Detroit, Toledo & Ironton	Feb.	464	805,328	496	837,672	95,196	146,930	16,157	230,549	513,994	61.4	323,678	125,462	155,999	277,020
	2 mos.	464	1,692,958	1,610	1,777,431	194,036	294,530	32,558	482,655	1,055,780	59.4	721,651	275,790	351,446	510,021
Duluth, Missabe & Iron Range	Feb.	546	160,086	3,807	184,784	230,939	340,385	5,547	276,844	900,247	487.2	—715,463	46,864	—749,500	—1,042,475
	2 mos.	546	258,501	9,773	318,502	545,530	674,215	10,263	556,832	1,875,413	588.8	—1,556,911	94,743	—1,655,036	—2,086,436
Duluth, Winnipeg & Pacific	Feb.	175	254,000	1,700	260,800	48,305	34,539	2,586	109,969	199,197	76.4	61,603	20,215	7,310	13,414
	2 mos.	175	501,000	3,400	514,100	80,162	66,185	5,184	217,458	377,309	73.4	136,791	40,095	31,951	15,974
Elgin, Joliet & Eastern	Feb.	392	1,125,727	2	1,229,393	229,688	337,696	18,031	623,998	1,270,558	103.4	—41,165	131,215	—287,972	341,693
	2 mos.	392	2,783,470	103	3,075,704	431,958	737,800	35,923	1,506,564	2,861,776	93.0	213,928	279,426	—317,956	811,094
Erie	Feb.	2,242	7,378,367	768,966	8,817,268	835,344	1,726,765	225,740	4,180,184	7,454,304	84.5	1,362,964	561,355	291,940	913,881
	2 mos.	2,242	15,973,001	1,752,114	19,059,909	1,690,601	3,477,181	454,871	8,887,849	15,499,148	81.3	3,560,761	1,472,513	1,099,061	1,718,525
Florida East Coast	Feb.	682	1,464,033	841,318	2,525,386	290,772	304,526	48,185	782,788	1,556,057	61.6	969,329	320,325	534,362	736,513
	2 mos.	682	3,045,650	1,780,628	5,275,588	601,801	633,546	102,200	1,577,810	3,179,638	60.3	2,095,950	660,998	1,222,812	1,509,822
Georgia Railroad	Feb.	328	483,421	71,890	590,551	87,356	110,749	22,925	288,217	533,880	90.4	56,671	33,094	25,081	114,188
	2 mos.	328	952,106	183,072	1,206,926	188,566	242,979	47,523	633,156	1,162,308	96.3	44,618	70,815	—13,632	344,805
Georgia & Florida	Feb.	408	178,858	3,371	187,229	49,013	25,052	11,462	71,280	164,363	87.8	22,866	11,738	—2,797	9,748
	2 mos.	408	359,790	6,840	376,614	96,634	52,284	22,190	145,928	332,649	88.3	43,965	23,779	—4,952	21,026
Grand Trunk Western	Feb.	1,026	1,929,000	134,000	2,226,000	466,540	509,767	42,489	1,185,442	2,303,452	103.5	—77,452	175,837	—266,213	410,177
	2 mos.	1,026	3,930,000	441,000	4,703,000	924,655	1,039,922	83,701	2,422,814	4,685,526	99.6	17,474	347,484	—406,397	856,778
Canadian National Lines in New England	Feb.	172	140,000	9,500	174,700	48,738	27,701	2,281	129,383	226,818	129.8	—52,118	21,716	—115,576	—133,407
	2 mos.	172	286,800	17,500	361,700	102,708	76,328	4,553	206,204	429,532	118.8	—67,832	43,432	—182,874	—235,887
Great Northern	Feb.	8,332	8,679,205	1,420,213	11,019,865	2,056,335	2,263,302	222,871	4,312,744	9,282,570	84.2	1,737,295	1,075,509	545,432	1,191,481
	2 mos.	8,332	17,992,150	3,472,925	23,437,250	4,118,762	4,799,709	469,539	9,036,557	19,329,085	82.5	4,108,165	2,441,661	1,584,666	2,528,831
Green Bay & Western	Feb.	233	211,920	413	216,594	41,730	23,096	10,158	84,312	169,528	78.2	47,066	30,622	6,299	19,011
	2 mos.	233	443,991	685	453,412	82,690	47,218	22,461	175,614	349,397	77.0	104,015	56,621	26,087	47,085
Gulf & Ship Island		Included in Illinois Central													

(Table continued on next left-hand page)

Pennsylvania Railroad's *Outstanding* Q-2 Locomotives are *all* equipped with Superheaters

designed to provide best combination of evaporating and superheating surfaces, maximum gas area, with high degree superheat and maximum steam area.



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REVENUES AND EXPENSES OF RAILWAYS

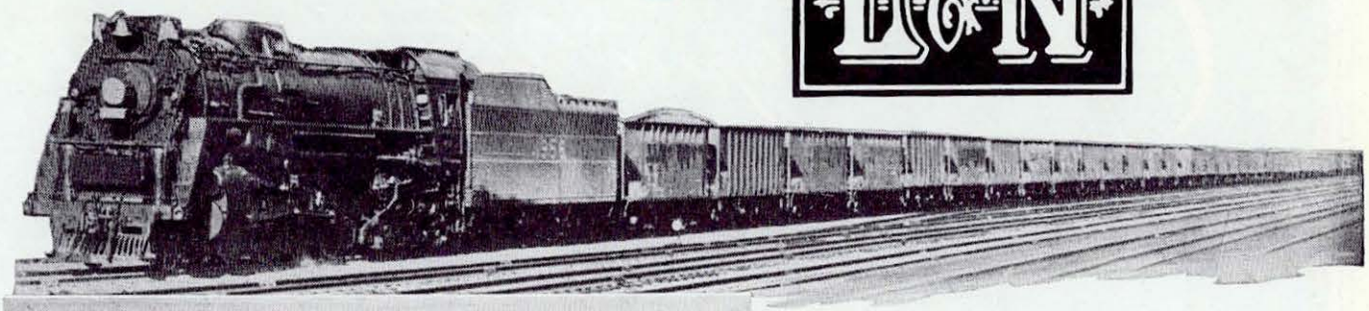
MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1946

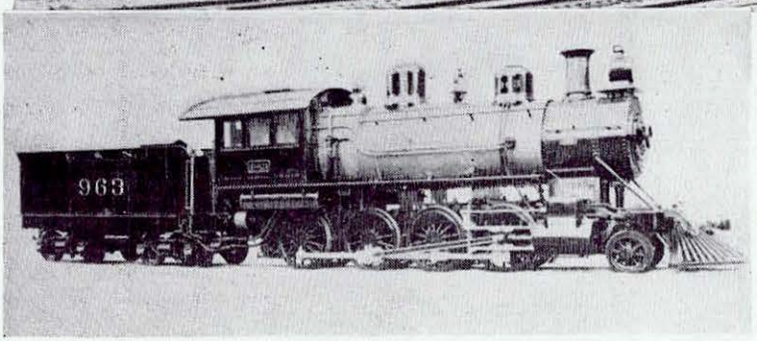
Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income: 1946	1945
Gulf, Mobile & Ohio	Feb.	1,945	$2,579,982	$149,630	$2,831,173	$533,042	$513,424	$91,819	$906,748	$2,177,990	76.9	$653,183	$255,887	$218,350	$334,309
	2 mos.	1,945	5,111,841	359,759	5,676,526	1,051,770	1,013,843	166,161	1,837,760	4,324,336	76.1	1,352,190	549,078	474,941	647,262
Illinois Central	Feb.	5,081	11,080,026	2,599,018	14,670,522	1,980,883	2,429,971	252,284	5,023,283	10,355,032	70.6	4,315,490	2,030,573	2,201,015	2,208,813
	2 mos.	5,081	21,926,215	5,190,768	29,183,040	4,165,794	5,043,285	497,941	10,569,756	21,701,406	74.4	7,481,634	3,619,662	3,683,873	4,352,254
Yazoo & Mississippi Valley	Feb.	1,524	1,749,770	320,379	2,181,085	406,968	230,880	37,793	719,415	1,467,668	67.3	713,417	204,016	445,636	135,422
	2 mos.	1,524	3,155,587	611,591	3,989,787	852,846	478,400	74,636	1,577,767	3,139,586	78.7	850,201	412,239	301,134	463,964
Illinois Central System	Feb.	6,605	12,829,796	2,919,397	16,851,607	2,387,851	2,660,851	290,077	5,742,698	11,822,700	70.2	5,028,907	2,239,155	2,650,564	2,349,148
	2 mos.	6,605	25,081,802	5,802,359	33,172,827	5,018,640	5,521,685	572,577	12,147,523	24,840,992	74.9	8,331,835	4,040,756	3,992,833	4,826,044
Illinois Terminal	Feb.	476	513,558	132,311	712,272	101,566	105,789	19,915	267,078	519,665	72.96	192,607	87,070	83,466	118,104
	2 mos.	476	1,055,186	274,091	1,466,547	209,302	210,409	41,242	549,497	1,062,383	72.44	404,164	182,994	182,896	237,699
Kansas City Southern	Feb.	890	1,789,525	241,537	2,225,233	186,482	286,091	67,924	691,144	1,343,367	60.4	881,866	295,000	470,802	562,544
	2 mos.	890	3,632,396	464,668	4,476,164	444,510	594,067	134,406	1,467,392	2,872,398	64.2	1,603,766	480,000	894,324	1,109,809
Kansas, Oklahoma & Gulf	Feb.	328	274,282	1,480	280,005	24,801	20,344	11,521	73,800	142,129	50.8	137,876	53,068	61,632	73,612
	2 mos.	328	587,274	3,366	598,793	47,796	47,257	23,116	154,173	297,135	49.6	301,658	116,201	140,573	150,472
Lake Superior & Ishpeming	Feb.	156	38,079	66	39,977	2,438	39,378	650	28,638	99,832	249.7	—59,855	32,265	—85,667	—74,647
	2 mos.	156	81,912	151	86,742	50,685	81,520	1,471	60,137	209,818	241.9	—123,076	55,200	—166,149	—155,865
Lehigh & Hudson River	Feb.	96	215,254	.....	215,912	27,678	22,949	5,807	79,724	142,560	66.0	73,352	30,369	27,537	29,395
	2 mos.	96	415,108	.....	416,438	53,953	57,203	11,277	148,889	285,302	68.5	131,136	57,183	45,177	46,189
Lehigh & New England	Feb.	190	491,102	.....	494,102	61,289	87,610	9,175	164,188	343,826	69.6	150,276	68,339	86,019	49,820
	2 mos.	190	930,821	.....	936,345	109,764	175,763	20,180	324,544	672,037	71.8	264,308	131,460	163,284	89,456
Lehigh Valley	Feb.	1,254	3,915,591	533,832	4,863,670	518,209	520,974	120,108	2,255,237	3,628,709	74.6	1,234,961	404,241	681,410	—422,839
	2 mos.	1,254	8,364,896	1,251,764	10,482,467	1,052,265	1,352,641	236,456	4,795,620	7,860,038	75.0	2,622,429	933,053	1,324,698	—699,649
Louisiana & Arkansas	Feb.	757	913,477	114,116	1,063,821	123,035	136,136	36,280	319,186	657,685	61.8	406,136	146,729	195,475	262,016
	2 mos.	757	1,812,169	234,162	2,125,567	269,200	290,482	70,536	665,717	1,386,569	65.2	738,998	265,556	350,138	482,669
Louisville & Nashville	Feb.	4,758	11,013,967	2,235,798	14,069,499	1,526,537	2,479,662	222,259	5,049,571	9,788,841	69.6	4,280,658	2,360,970	2,405,670	2,137,482
	2 mos.	4,758	22,074,241	4,651,738	28,529,414	3,330,236	5,205,386	435,755	10,482,305	20,500,421	71.9	8,028,993	4,456,690	4,547,300	4,306,211
Maine Central	Feb.	988	1,502,431	223,339	1,825,887	262,089	287,020	14,698	714,385	1,327,826	72.7	498,061	199,469	190,257	149,148
	2 mos.	988	3,046,422	427,931	3,691,914	546,477	608,234	27,954	1,471,715	2,755,215	74.6	936,699	364,306	340,777	233,142
Midland Valley	Feb.	334	115,678	23	117,731	19,972	12,822	2,621	40,262	80,891	68.7	36,840	8,773	18,704	26,441
	2 mos.	334	249,716	45	253,983	40,251	25,224	5,319	87,702	169,336	66.7	84,647	32,756	35,327	45,360
Minneapolis & St. Louis	Feb.	1,408	1,076,576	35,730	1,164,031	237,149	177,253	77,593	431,422	983,314	84.5	180,717	108,260	**29,716**	**138,076**
	2 mos.	1,408	2,178,377	108,242	2,389,552	472,097	376,505	162,110	877,771	2,007,493	84.0	382,059	214,028	93,551	270,353
Minneapolis, St. Paul & Sault Ste. Marie	Feb.	3,224	1,313,961	138,124	1,585,568	392,812	388,290	39,902	909,898	1,802,244	113.7	—216,676	144,901	—346,806	—4,527
	2 mos.	3,224	2,926,615	294,376	3,509,177	749,492	747,908	82,363	1,848,768	3,574,940	101.9	—65,763	299,693	—365,539	—50,458
Duluth, South Shore & Atlantic	Feb.	530	278,201	14,816	309,748	53,043	54,679	11,217	137,591	264,124	85.3	45,624	18,841	12,745	5,890
	2 mos.	530	556,282	31,122	622,518	110,142	112,113	23,603	282,836	544,498	87.5	78,020	38,244	24,158	10,401
Spokane International	Feb.	152	116,028	1,761	125,063	41,445	11,800	2,951	37,427	**99,935**	79.9	25,128	9,392	9,739	23,166
	2 mos.	152	209,107	4,684	228,751	58,428	23,980	5,762	76,290	177,059	77.4	51,692	18,925	20,676	46,756
Mississippi Central	Feb.	158	117,641	2,769	123,812	30,249	16,439	9,399	35,237	98,063	79.2	25,749	6,697	6,562	25,471
	2 mos.	158	222,865	13,224	242,776	59,869	33,800	18,803	71,616	198,155	81.6	44,621	14,572	4,638	50,978
Missouri & Arkansas	Feb.	365	137,233	1,777	147,609	39,446	19,277	7,189	65,602	138,162	93.6	9,447	6,227	—13,058	19,943
	2 mos.	365	253,403	3,898	279,262	82,525	43,391	15,692	130,075	283,866	101.7	—4,604	12,526	—48,453	24,206
Missouri-Illinois	Feb.	172	215,094	245	217,596	32,371	28,078	4,176	60,790	132,488	60.9	85,108	39,936	40,235	35,049
	2 mos.	172	444,508	681	448,802	65,455	57,177	9,070	127,708	274,025	61.1	174,777	82,261	86,112	69,647
Missouri-Kansas-Texas Lines	Feb.	3,253	3,481,024	774,866	4,638,694	653,316	539,338	181,938	1,614,299	3,209,807	69.2	1,428,887	582,283	668,787	703,481
	2 mos.	3,253	7,259,386	1,626,830	9,783,011	1,499,487	1,138,681	359,903	3,401,233	6,867,613	70.2	2,915,398	1,200,735	1,352,820	1,364,164
Missouri Pacific	Feb.	7,080	10,833,492	2,009,099	13,935,844	1,599,100	2,199,337	304,648	4,827,771	9,461,497	67.9	4,474,347	1,321,220	2,536,210	2,973,626
	2 mos.	7,080	21,260,841	4,480,636	28,107,797	3,335,729	4,651,913	635,809	10,136,565	19,874,058	70.7	8,233,739	2,500,426	4,575,186	5,981,054
Gulf Coast Lines	Feb.	1,734	3,032,260	243,199	3,397,189	481,104	311,604	55,868	844,149	1,766,502	52.0	1,630,687	495,640	805,909	490,146
	2 mos.	1,734	6,099,375	528,800	6,898,773	942,135	628,189	116,520	1,769,895	3,623,322	52.52	3,275,451	1,014,902	1,637,350	1,147,290
International-Great Northern	Feb.	1,110	1,471,234	297,516	1,990,403	381,627	297,503	39,024	722,538	1,534,554	77.1	455,849	91,179	214,896	277,013
	2 mos.	1,110	2,926,331	676,775	4,089,906	778,309	600,864	80,193	1,521,183	3,173,333	77.6	916,573	187,177	424,684	594,558
Monongahela	Feb.	170	581,277	1,749	585,973	56,717	47,661	638	157,335	266,389	45.5	319,584	66,694	157,840	60,246
	2 mos.	170	1,182,425	3,946	1,191,912	120,863	98,723	1,297	322,310	551,047	46.2	640,865	133,712	310,643	156,965

(Table continued on second left-hand page)

In Use on the

L&N





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		Valve Rings, All Shapes

Congratulations

TO THE

"PENNSYLVANIA"

ON ITS

CENTENNIAL ANNIVERSARY

Since 1846, and the granting of its first charter for 249 miles of road, the Pennsylvania Railroad has grown great with the country it has helped to create. Through peace and war it has been one of the nation's vital arteries and the keystone of commerce to cities it serves.

Union Switch and Signal Company is proud to have been chosen to work with those who have guided the Pennsylvania Railroad through a century of progress. Ours has been the great honor of joining with them in the research and development of many outstanding advancements in the science of transporting goods and passengers by rail—with ever increasing safety, comfort and speed—and at the lowest possible cost. From the simple signaling and switching devices of the 1800's, to today's complex and highly efficient ones which safeguard and expedite movement of modern trains over many of its 26,000 miles of track, "Union" products and systems have aided the "Pennsylvania."

Now, having served the Pennsylvania Railroad in its first one hundred years of progress, we look forward with it to still greater achievement in modern rail transportation.

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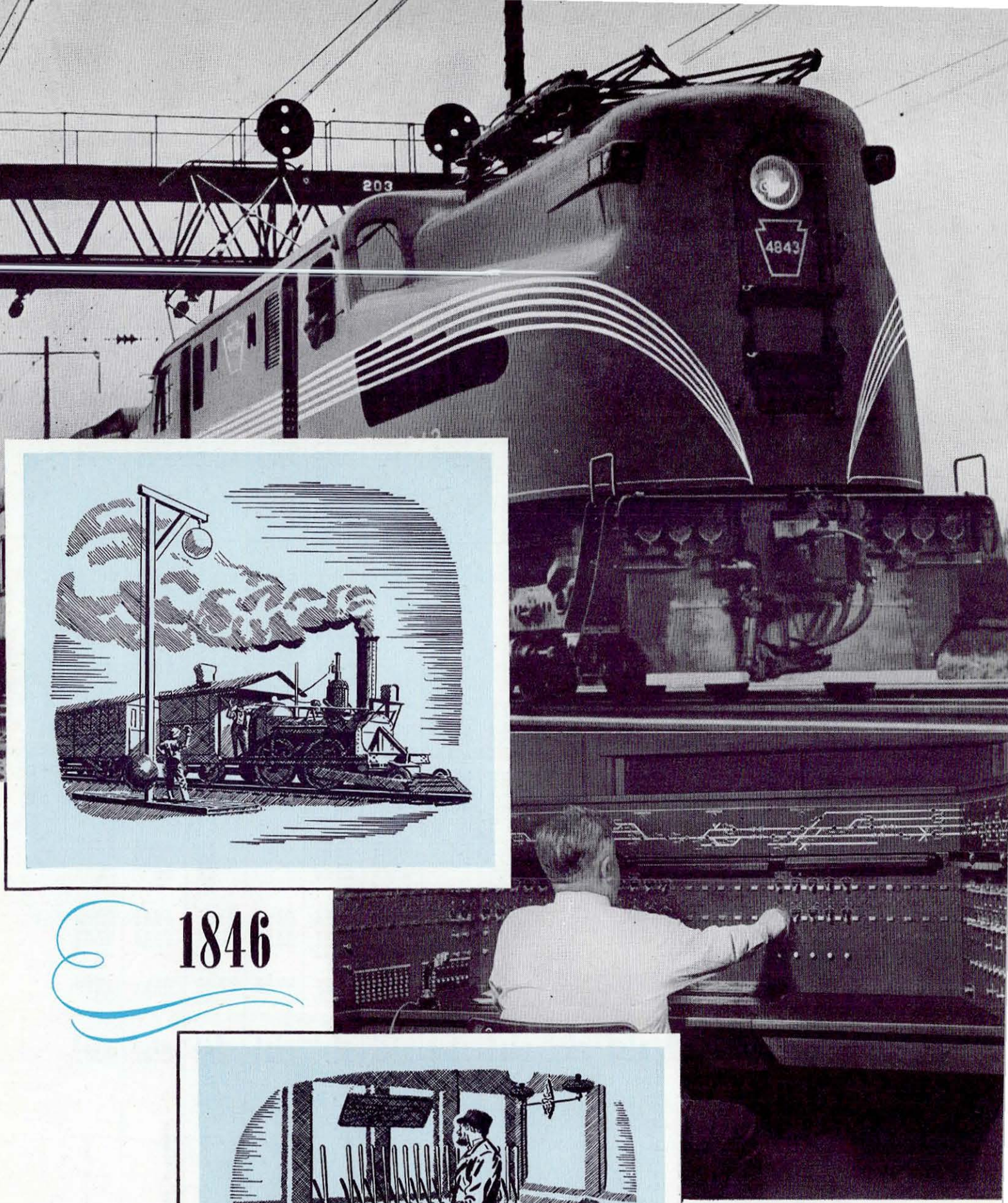
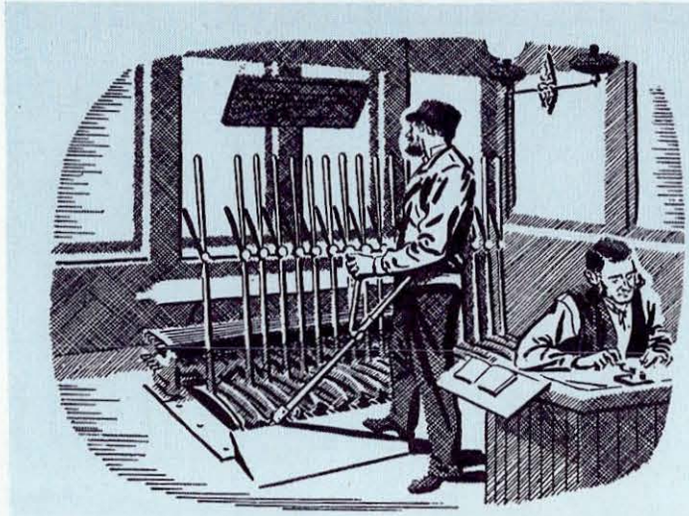


1846



1946

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1946

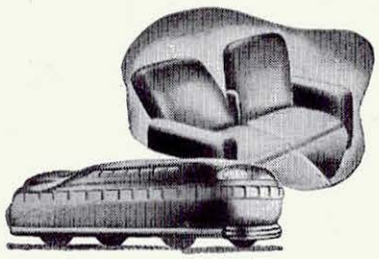
Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income: 1946	1945
Montour	Feb.	51	$208,021	.....	$209,221	$15,588	$64,967	$1,839	$84,164	$175,185	83.73	$34,036	$34,908	$36,023	$30,245
	2 mos.	51	448,749	.....	451,674	31,785	131,992	3,073	167,315	352,494	78.04	99,180	83,974	94,074	70,334
Nashville, Chattanooga & St. Louis	Feb.	1,053	1,687,158	$439,734	2,329,519	449,068	442,053	89,750	930,229	1,946,749	83.6	382,770	50,557	333,815	509,134
	2 mos.	1,053	3,400,123	926,938	4,784,975	958,841	930,144	169,668	1,894,145	4,073,710	85.1	711,265	253,030	477,457	973,547
New York Central	Feb.	10,746	29,175,604	11,710,560	45,025,806	5,969,385	9,223,239	745,432	20,622,946	38,928,742	86.5	6,097,064	4,027,074	544,250	2,466,396
	2 mos.	10,746	62,119,025	25,030,723	96,137,945	13,923,579	19,884,591	1,516,729	43,240,905	83,430,077	86.8	12,707,868	8,280,570	1,542,791	4,931,677
Pittsburgh & Lake Erie	Feb.	229	1,480,988	88,575	1,623,094	292,353	754,858	48,966	783,647	1,995,928	123.0	—372,834	195,288	18,089	260,525
	2 mos.	229	3,401,373	189,859	3,724,106	673,505	1,554,475	92,585	1,707,266	4,262,411	114.5	—538,305	471,529	192,669	516,679
New York, Chicago & St. Louis	Feb.	1,687	4,850,179	245,748	5,215,428	739,393	860,115	150,907	2,186,073	4,132,194	79.2	1,083,234	408,623	430,464	1,083,243
	2 mos.	1,687	10,132,800	574,790	10,969,720	1,551,701	1,771,111	314,281	4,420,470	8,463,767	77.2	2,505,953	915,990	1,007,941	2,419,899
New York, New Haven & Hartford	Feb.	1,838	5,669,082	5,096,962	11,703,131	1,574,249	1,637,407	208,932	4,675,978	8,827,471	75.4	2,875,660	940,000	887,950	889,633
	2 mos.	1,838	11,472,139	10,522,718	23,994,878	3,266,938	3,506,696	380,606	9,800,813	18,481,107	77.0	5,513,771	1,870,000	1,703,560	2,043,297
New York Connecting	Feb.	21	171,735	.....	173,200	45,967	32,311	.....	56,854	136,814	79.0	36,386	65,334	97,527	65,190
	2 mos.	21	340,961	.....	346,872	89,733	41,944	.....	129,805	264,930	76.4	81,942	124,465	232,936	227,134
New York, Ontario & Western	Feb.	547	423,401	6,002	500,672	75,788	94,711	22,594	284,138	505,018	100.9	—4,346	34,656	—106,484	—272,374
	2 mos.	547	863,309	10,325	1,001,030	154,239	191,982	45,549	569,060	1,016,765	101.6	—15,735	69,051	—215,544	—547,735
New York, Susquehanna & Western	Feb.	120	264,085	38,302	318,190	28,020	33,133	4,280	145,094	225,588	70.9	92,602	40,757	—8,462	39,032
	2 mos.	120	587,898	82,031	701,169	58,637	66,438	8,358	302,398	468,836	66.9	232,333	80,052	20,417	52,070
Norfolk & Western	Feb.	2,161	9,566,504	1,169,406	11,000,998	1,302,886	2,062,662	175,619	2,986,356	6,866,348	62.4	4,134,650	2,260,319	2,733,187	2,081,750
	2 mos.	2,161	20,129,855	2,341,921	23,058,180	2,700,194	4,233,735	354,591	6,143,551	14,130,548	61.3	8,927,632	4,783,408	5,910,227	4,167,192
Norfolk Southern	Feb.	727	603,411	19,014	639,229	151,251	79,497	28,699	218,253	505,973	79.2	133,256	46,881	45,612	36,669
	2 mos.	727	1,190,561	31,875	1,260,244	290,152	151,762	61,088	441,303	1,005,730	79.6	256,514	95,745	94,159	76,462
Northern Pacific	Feb.	6,872	6,581,955	1,412,377	8,873,644	1,650,548	1,800,029	187,942	3,571,800	7,742,565	87.3	1,131,079	764,763	684,022	1,581,662
	2 mos.	6,872	14,370,132	3,439,758	19,717,814	3,365,828	3,773,447	369,362	7,580,890	16,222,408	82.3	3,495,406	2,050,570	2,223,575	3,240,741
Northwestern Pacific	Feb.	331	262,279	5,072	286,922	161,547	64,503	3,756	146,550	385,094	134.2	—98,172	27,507	—150,660	36,329
	2 mos.	331	581,697	5,347	626,575	332,344	122,788	6,219	349,076	827,427	132.1	—200,852	55,153	—315,523	126,905
Oklahoma City-Ada-Atoka	Feb.	132	80,941	1	83,474	17,597	4,591	1,059	21,643	48,328	57.9	35,146	10,933	11,989	17,628
	2 mos.	132	173,282	1	185,918	35,690	9,557	2,176	46,975	100,932	54.3	84,986	24,927	29,642	41,222
Pennsylvania	Feb.	10,121	36,676,834	18,052,008	59,386,967	6,330,966	13,207,622	1,078,667	28,451,241	51,969,240	87.5	7,417,727	2,571,247	4,320,611	7,731,629
	2 mos.	10,121	78,541,412	39,174,258	127,849,382	13,110,826	27,642,019	2,079,704	59,914,930	108,644,010	85.0	19,205,372	8,100,139	10,558,324	14,323,142
Long Island	Feb.	376	1,003,381	1,954,301	3,163,738	383,685	446,441	10,799	1,640,271	2,546,251	80.5	617,487	283,417	65,906	33,954
	2 mos.	376	2,046,364	4,057,491	6,499,305	769,690	927,636	34,664	3,343,664	5,216,025	80.3	1,283,280	542,338	214,905	—13,622
Pennsylvania-Reading Seashore Lines	Feb.	390	370,174	214,745	617,723	152,040	95,759	6,186	409,810	685,415	111.0	—67,692	73,169	—237,552	—173,401
	2 mos.	390	745,099	414,637	1,215,371	341,947	202,296	13,308	855,976	1,458,251	120.0	—242,880	145,781	—578,478	—428,681
Pere Marquette	Feb.	1,949	3,128,745	181,380	3,451,976	544,447	680,546	81,874	1,537,969	3,008,426	87.2	443,550	245,937	182,855	650,768
	2 mos.	1,949	6,458,599	425,053	7,204,523	1,109,501	1,419,529	166,896	3,120,085	6,147,448	85.3	1,057,075	557,618	398,605	1,070,166
Pittsburg & Shawmut	Feb.	97	133,929	.....	134,636	15,913	25,387	2,382	39,168	88,418	65.7	46,218	4,683	36,677	18,608
	2 mos.	97	276,469	.....	277,896	34,032	50,176	4,106	82,468	182,356	65.6	95,540	9,110	76,436	39,965
Pittsburgh & West Virginia	Feb.	136	256,657	.....	277,044	55,676	69,426	25,503	100,905	277,317	100.1	—273	25,025	5,434	196,868
	2 mos.	136	577,191	.....	618,936	121,069	159,002	51,353	222,007	606,262	97.8	12,674	52,107	23,836	394,672
Pittsburg, Shawmut & Northern	Feb.	190	85,800	.....	86,533	16,828	14,638	982	43,978	81,941	94.7	4,592	5,724	—10,120	—9,121
	2 mos.	190	175,545	.....	176,995	34,384	30,296	1,991	87,672	166,681	94.2	10,314	11,616	—17,781	—26,114
Reading	Feb.	1,362	6,372,233	1,046,286	7,811,599	1,187,944	1,591,675	89,031	3,080,139	6,167,096	79.0	1,644,503	940,168	680,948	992,184
	2 mos.	1,362	13,320,641	2,226,780	16,342,035	2,395,826	3,235,963	179,410	6,636,592	12,902,713	79.0	3,439,322	1,755,493	1,442,054	2,084,516
Richmond, Fredericksburg & Potomac	Feb.	118	1,085,904	966,844	2,217,288	212,146	264,679	14,767	718,768	1,317,127	59.4	900,161	379,238	410,394	173,398
	2 mos.	118	2,219,588	2,085,708	4,652,088	496,569	540,833	29,177	1,475,677	2,756,726	59.3	1,895,362	806,906	866,522	381,902
Rutland	Feb.	407	275,046	45,056	378,356	57,388	89,530	12,316	228,674	401,327	106.1	—22,971	25,659	—55,585	—74,419
	2 mos.	407	581,419	93,052	793,346	128,550	184,657	24,767	474,529	843,243	106.3	—49,897	53,048	—111,033	—211,801
St. Louis-San Francisco	Feb.	4,645	5,287,026	1,327,546	7,209,101	1,279,048	1,485,009	177,592	2,843,197	6,121,418	84.9	1,087,683	494,734	638,761	1,431,006
	2 mos.	4,645	10,824,556	2,970,212	15,098,045	2,653,898	3,151,437	354,981	5,927,261	12,794,214	84.7	2,303,831	1,006,233	1,418,259	2,843,930
St. Louis, San Francisco & Texas	Feb.	160	178,723	25,246	213,144	33,081	30,287	11,148	113,838	195,627	91.8	17,517	11,853	—24,446	37,551
	2 mos.	160	461,801	53,073	533,638	66,848	64,283	22,680	220,390	389,212	72.9	144,426	23,748	64,449	56,964

REVENUES AND EXPENSES OF RAILWAYS

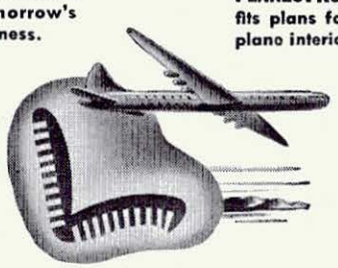
MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1946

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Railway tax accruals	Net railway operating income: 1946	1945
St. Louis Southwestern Lines	Feb.	1,576	$3,068,282	$112,022	$3,304,767	$460,230	$541,946	$103,887	$1,009,079	$2,239,993	67.8	$1,064,774	$314,690	$604,723	$926,670
	2 mos.	1,576	6,456,374	332,098	7,055,872	1,508,700	1,104,235	210,129	2,130,085	5,229,161	74.1	1,826,711	587,464	943,490	1,849,680
Seaboard Air Line	Feb.	4,150	6,773,254	2,300,253	9,729,861	1,354,594	1,453,599	252,788	3,264,358	6,747,189	69.3	2,982,672	952,720	1,607,614	1,682,746
	2 mos.	4,150	13,548,831	4,939,069	19,864,720	2,680,183	2,992,792	496,000	6,769,187	13,810,952	69.5	6,053,768	1,909,583	3,342,025	3,470,487
Southern Railway	Feb.	6,484	12,519,741	3,676,699	17,367,050	2,478,782	2,834,797	289,591	6,063,550	12,294,361	70.8	5,072,689	2,276,348	2,491,632	2,919,264
	2 mos.	6,484	25,318,866	7,651,202	35,460,213	5,056,145	5,895,048	584,016	12,398,389	25,248,177	71.2	10,212,036	4,442,252	5,148,322	5,497,789
Alabama Great Southern	Feb.	315	758,880	291,501	1,116,405	174,848	247,536	24,452	381,924	875,734	78.4	240,671	133,278	103,387	145,403
	2 mos.	315	1,555,651	642,961	2,362,272	366,320	518,650	50,059	791,517	1,840,342	77.9	521,930	293,503	206,984	380,168
Cincinnati, New Orleans & Texas Pacific	Feb.	337	1,615,499	408,334	2,187,929	276,394	495,098	39,672	682,308	1,579,831	72.2	608,098	320,943	359,855	396,470
	2 mos.	337	3,330,287	843,729	4,483,472	586,328	1,068,312	77,797	1,422,579	3,334,526	74.4	1,148,946	597,393	662,223	778,310
Georgia Southern & Florida	Feb.	397	300,559	123,954	476,992	78,496	65,198	5,623	167,870	332,979	69.8	144,013	50,665	64,811	66,473
	2 mos.	397	592,049	267,808	960,515	172,636	128,043	11,310	336,762	681,723	71.0	278,792	100,562	122,476	136,668
New Orleans & Northeastern	Feb.	204	448,821	170,183	656,051	112,375	76,346	13,407	180,087	413,191	63.0	242,860	95,439	94,422	119,941
	2 mos.	204	974,887	336,641	1,402,553	229,497	159,529	26,599	373,128	864,678	61.6	537,875	217,172	199,460	274,991
Southern Pacific	Feb.	8,247	19,165,259	7,221,376	29,192,134	4,657,536	6,184,248	618,480	10,898,674	24,429,158	83.7	4,762,976	2,453,094	1,447,239	2,700,659
	2 mos.	8,247	40,547,984	15,651,201	62,318,821	9,163,159	12,913,387	1,274,097	22,967,539	50,559,627	81.1	11,759,194	5,359,848	4,420,466	5,654,547
Texas & New Orleans	Feb.	4,322	6,122,123	1,575,822	8,251,202	1,296,885	1,291,265	163,309	2,584,369	5,694,458	69.0	2,556,744	1,011,473	1,125,139	1,028,432
	2 mos.	4,322	12,313,987	3,563,162	17,088,867	2,577,572	2,510,537	318,605	5,317,956	11,494,107	67.3	5,594,760	2,209,590	2,553,610	2,146,252
Spokane, Portland & Seattle	Feb.	944	1,296,607	113,820	1,500,937	463,097	165,860	14,701	498,321	1,197,655	79.8	303,282	108,911	105,518	209,281
	2 mos.	944	2,382,594	269,530	2,858,821	808,551	338,544	29,296	1,067,503	2,366,757	82.8	492,064	235,705	67,827	542,189
Tennessee Central	Feb.	286	248,128	16,535	280,397	59,171	53,257	5,764	120,451	252,478	90.0	27,919	21,064	—13,278	29,679
	2 mos.	286	470,777	40,235	544,324	114,697	106,054	12,513	247,143	509,030	93.5	35,294	42,242	—42,442	72,220
Texas & Pacific	Feb.	1,874	2,796,050	1,017,489	4,248,162	593,282	480,253	121,129	1,284,159	2,732,801	64.3	1,515,361	560,854	803,610	654,266
	2 mos.	1,874	5,561,187	2,283,893	8,775,410	1,185,627	1,104,524	242,212	2,799,813	5,864,585	66.8	2,910,825	999,896	1,592,624	1,408,633
Texas Mexican	Feb.	162	153,554	563	173,598	36,589	29,718	4,142	44,696	114,982	66.2	58,616	18,269	29,728	—5,920
	2 mos.	162	303,513	885	344,652	56,673	45,012	7,647	90,904	219,926	63.8	124,726	36,753	64,664	—68,570
Toledo, Peoria & Western	Feb.	.....	*6,293	418	*5,900	153	1,661	15	320	6,490	...	—12,390	148	—12,073	177,084
	2 mos.	.....	*11,354	410	*10,969	221	1,886	29	4,243	15,254	...	—26,223	228	—25,986	374,687
Union Pacific System	Feb.	9,777	19,122,679	5,985,178	27,810,471	2,914,209	4,762,009	536,327	9,609,049	19,465,277	70.0	8,345,194	4,056,729	3,878,293	2,425,918
	2 mos.	9,777	39,839,543	13,682,617	59,336,505	6,723,161	10,455,413	1,095,125	20,197,165	41,955,319	70.7	17,381,186	8,397,213	7,753,454	5,270,123
Utah	Feb.	111	160,457	.....	160,533	21,199	41,341	655	54,728	122,827	76.5	37,706	18,268	17,071	13,102
	2 mos.	111	331,666	.....	331,958	41,709	90,651	1,325	112,955	256,352	77.2	75,606	36,879	33,976	30,199
Virginian	Feb.	661	2,303,222	6,576	2,376,517	249,754	561,659	28,089	519,384	1,418,038	59.7	958,479	471,000	628,323	572,902
	2 mos.	661	4,752,878	14,294	4,914,685	538,464	1,181,898	58,837	1,074,305	2,972,643	60.5	1,942,042	962,000	1,278,389	1,152,510
Wabash	Feb.	2,393	5,134,650	668,635	6,241,641	765,090	889,566	182,586	2,455,955	4,503,782	72.2	1,737,859	678,071	745,654	858,901
	2 mos.	2,393	10,086,241	1,453,227	12,426,334	1,542,864	1,802,762	367,368	5,015,573	9,204,823	74.1	3,221,511	1,285,591	1,360,014	1,564,246
Ann Arbor	Feb.	294	453,959	4,606	467,560	51,978	84,764	16,866	218,929	381,817	81.7	85,743	38,819	35,577	52,169
	2 mos.	294	905,674	12,192	936,013	101,926	171,191	34,237	447,272	776,367	82.9	159,646	77,152	68,626	83,155
Western Maryland	Feb.	839	2,291,179	39,150	2,458,227	297,716	455,890	52,705	821,698	1,732,105	70.5	726,122	305,000	440,221	590,558
	2 mos.	839	4,815,147	131,192	5,154,101	590,225	916,448	107,537	1,696,069	3,521,662	68.3	1,632,439	680,000	1,014,121	1,176,382
Western Pacific	Feb.	1,195	2,328,489	835,986	3,290,629	491,189	465,374	92,236	1,105,947	2,308,997	70.2	981,632	390,760	483,193	545,177
	2 mos.	1,195	5,181,494	1,828,292	7,272,911	1,078,133	1,044,529	193,380	2,272,774	4,912,402	67.5	2,360,509	937,183	1,161,444	1,136,893
Wheeling & Lake Erie	Feb.	505	1,212,112	.....	1,239,729	163,255	331,712	46,022	474,506	1,073,107	86.6	166,622	192,711	131,750	294,757
	2 mos.	505	2,761,969	4	2,830,199	342,631	653,045	92,087	1,031,023	2,229,443	78.8	600,756	504,569	448,172	578,139
Wisconsin Central	Feb.	1,051	1,491,741	104,606	1,746,412	195,043	285,836	41,038	791,176	1,371,727	78.5	374,685	107,994	101,445	121,989
	2 mos.	1,051	2,995,563	202,725	3,504,014	398,154	550,005	85,188	1,655,812	2,812,067	80.3	691,947	219,521	267,164	233,036

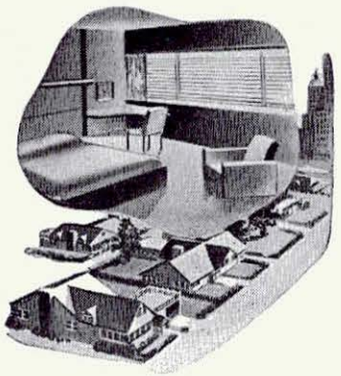
* Credit



BUSES & TRUCKS: Koylon clean, durable comfort is perfect for tomorrow's heavy duty business.



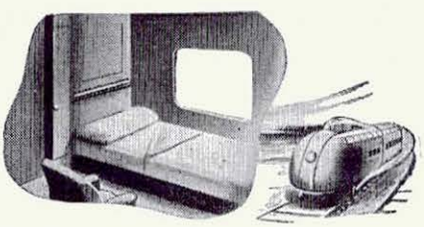
PLANES: Koylon lightness fits plans for tomorrow's plane interiors.



SERVING THROUGH SCIENCE

INTERIORS: Koylon adaptability is especially suited for upholsterers and designers of tomorrow's interiors.

Built-in comfort for modern rail travel



TRAINS: Koylon all-condition restfulness is ideal for the cars of tomorrow's streamliners.

WHEN A PRODUCT ushers in a wonderful new era of comfort, it belongs in your plans. That's what Koylon did.

For eleven years, Koylon has proved itself the comfort cushioning of the age. It breathes comfort — the kind that will be appreciated by the user — the kind that means constant good will for you.

At every contact with the body, thousands of tiny Koylon latex cells release air. That's the famous Koylon breathing action — the secret of Koylon's comfort. It's also the secret of Koylon's resilience and natural cleanliness — dust-free, moisture-free, vermin-free.

Light, long-lasting, a single unit free of bothersome parts to wear out and lose shape — Koylon is both simple and amazingly inexpensive to maintain. It has proved its value in the past — and it belongs in the future. Particularly, Koylon belongs in your future plans.

Comfort Engineered

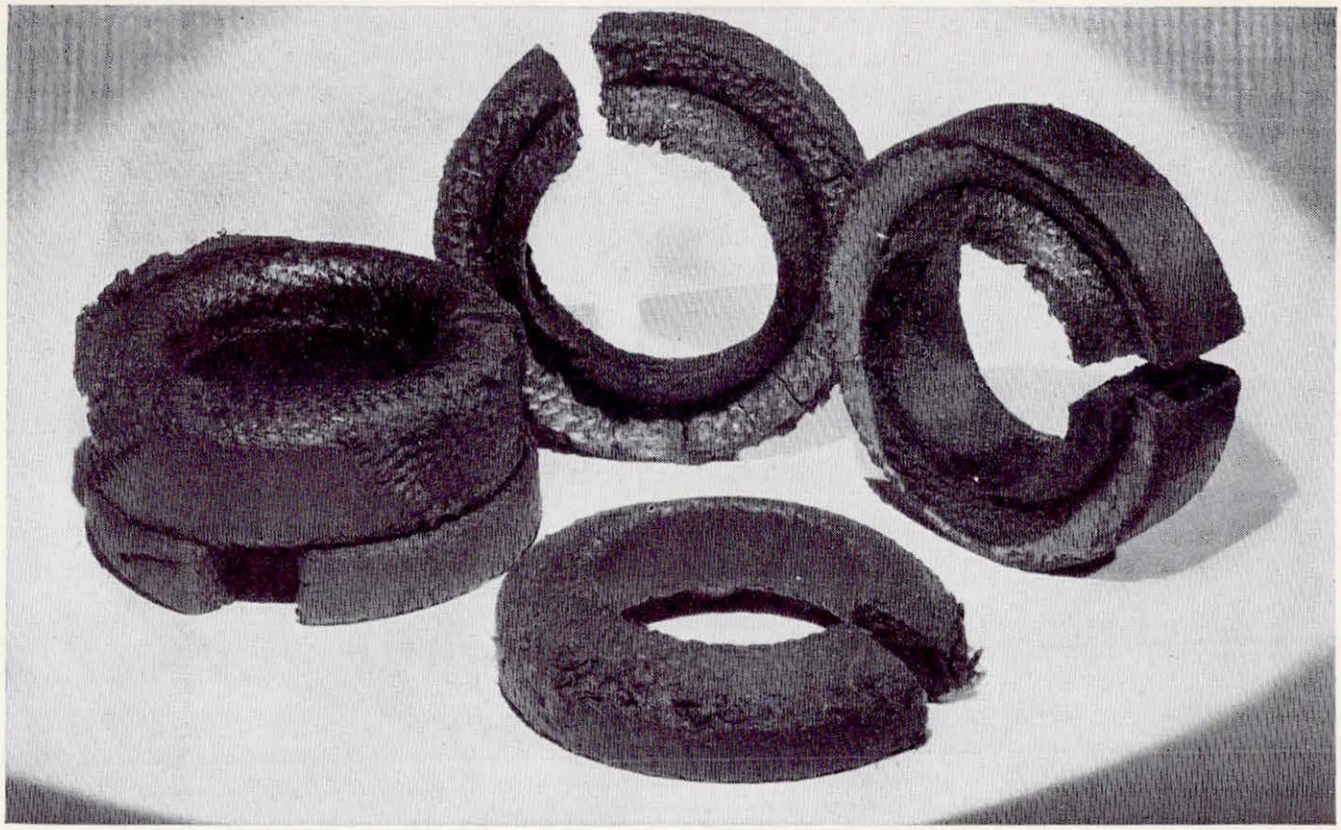
"U.S." *Koylon* FOAM

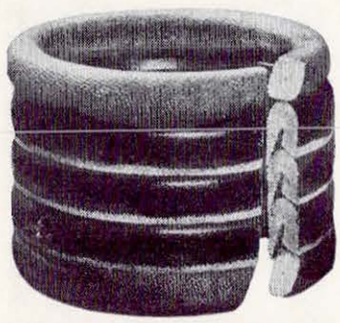
REG. U.S. PAT. OFF.

UNITED STATES RUBBER COMPANY

"U. S." KOYLON FOAM DIVISION · MISHAWAKA, INDIANA

AFTER 22 YEARS OF ACTIVE DUTY
—this set of J-M Packing was still tight!





Sea Rings have a Tapered Lip, firm but flexible, which *seals automatically* on the power stroke—but releases *saving power and wear,* on the return stroke. This construction assures long, efficient service—and cuts down maintenance and time-consuming replacements.

THE photograph above shows a set of Johns-Manville Sea Rings exactly as they looked after 22 years of service on an Ingersoll Rand air compressor. They were in continuous operation, averaging 14 hours per day during this entire period.

Note the few signs of wear. This set of long-wearing packing was still tight—still good for further service!

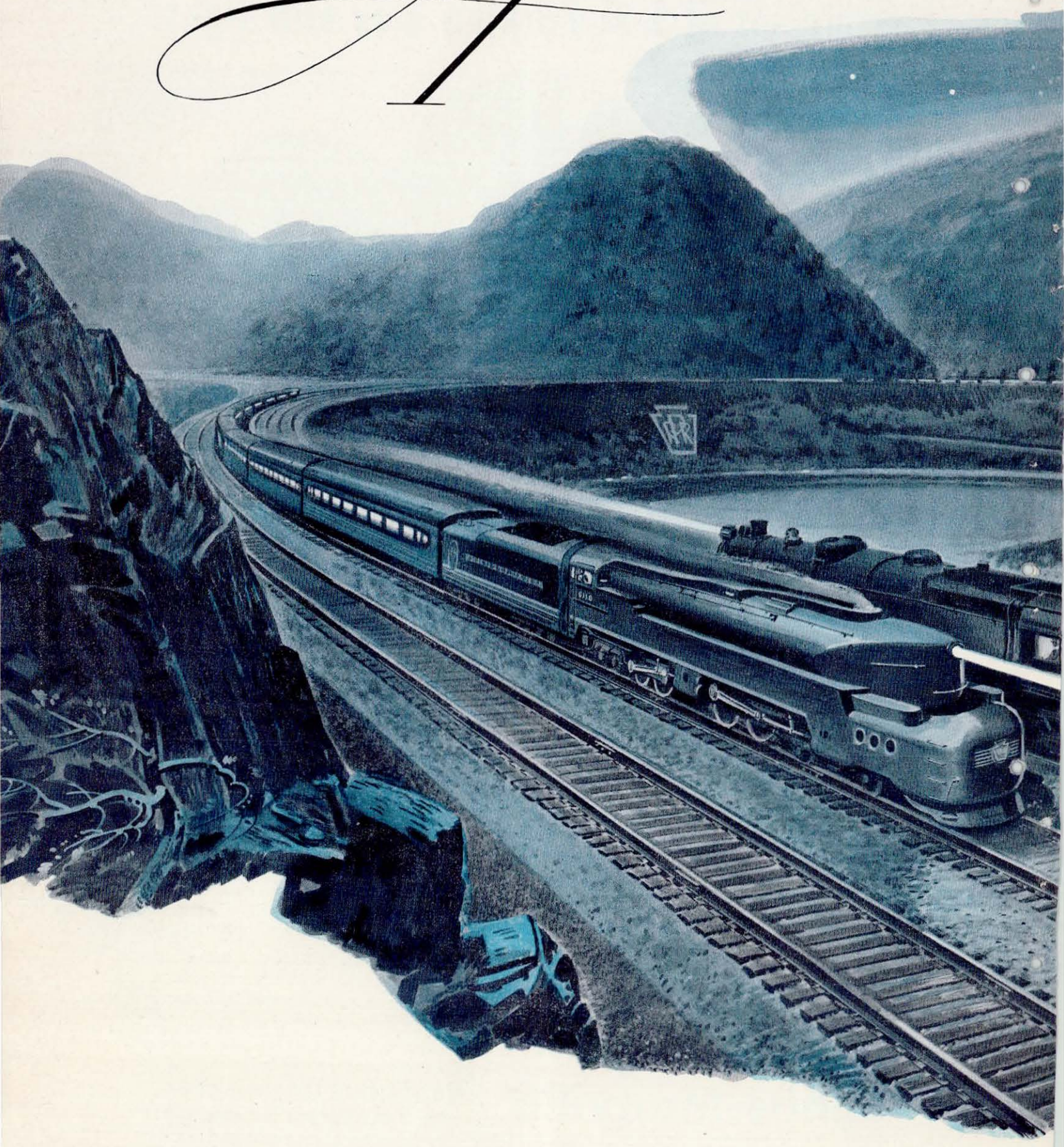
Performance such as this is the reason why Sea Rings are No. 1 choice of so many railroad men for use on reciprocating rods and plungers. A precision-made packing in every way, they are designed to provide long, highly efficient performance with virtual freedom from costly maintenance expense. Their automatic action, as described at left, assures a tight seal with an absolute minimum of friction.

Sea Rings are made to order for the specific service. For further details, write Johns-Manville at New York, Chicago, Cleveland, St. Louis or San Francisco.

Johns-Manville

88 YEARS OF SERVICE TO TRANSPORTATION

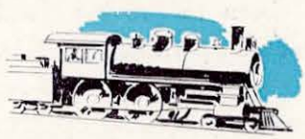
A CENTURY



OF PIONEERING

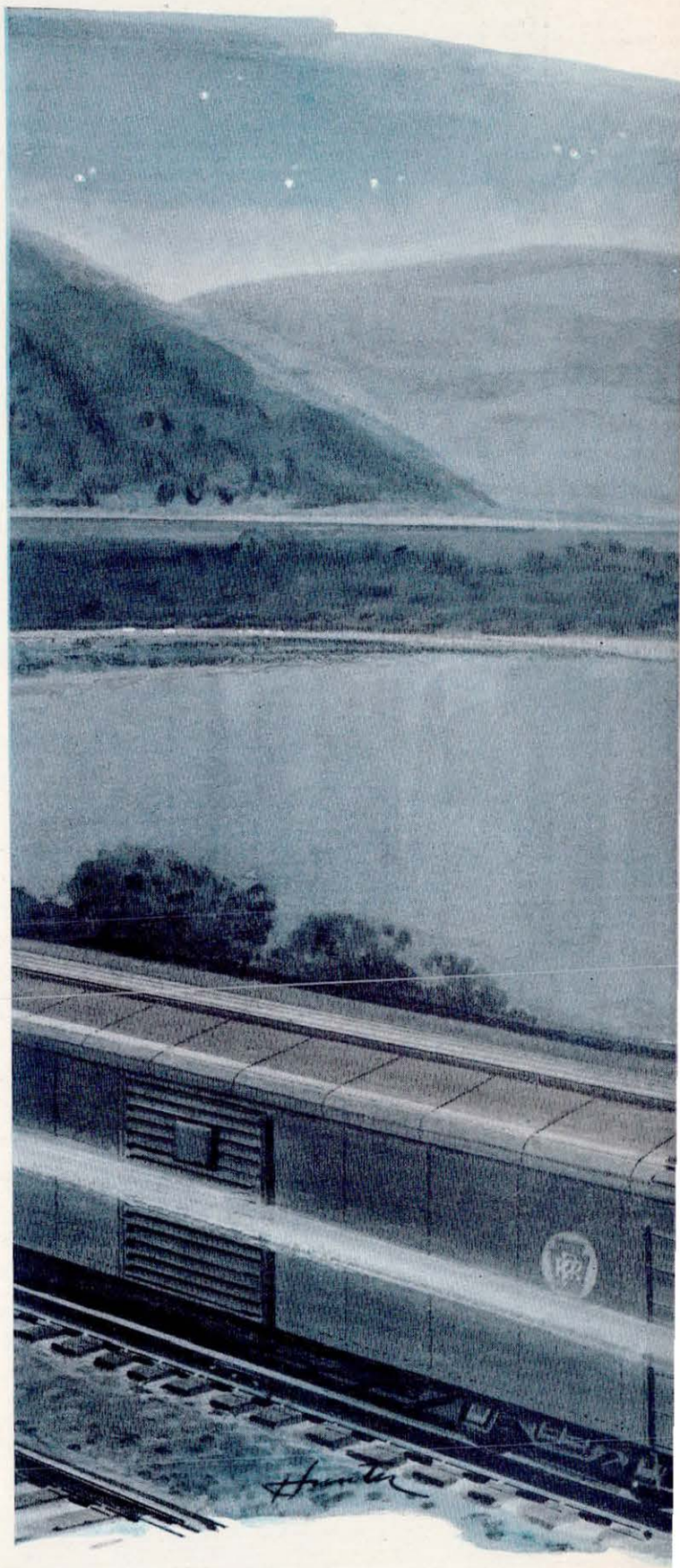
We salute a great pioneer railroad, now rounding out a century of service to the nation. The occasion has added significance to us, for it is also the hundredth anniversary of another pioneer . . . George Westinghouse, whose air brake has been so intimately associated with transportation progress.

The start of an association that has continued without a break since 1869 came when the Pennsylvania pioneered in the use of the original "Atmospheric" brake . . . and thus demonstrated the possibilities of this revolutionary development.



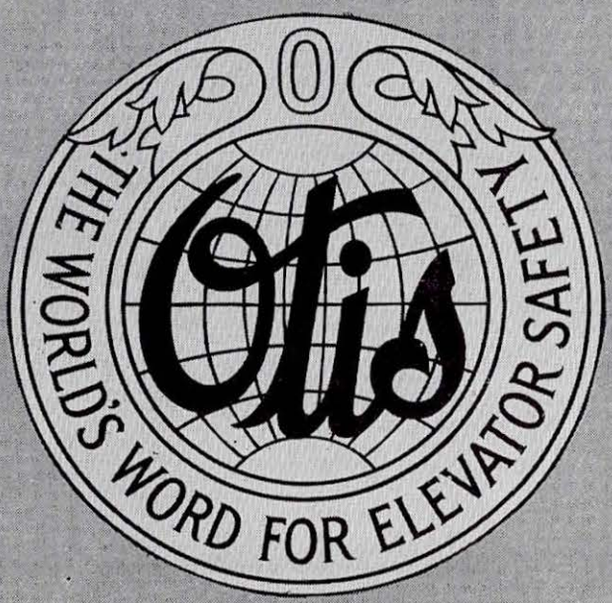
Another important milestone came in 1887. The Pennsylvania recognized the value of the first quick action automatic air brake. The test run at Hawkins, Pa., east of Pittsburgh, confirmed this confidence, and marked the beginning of a new era in rail transportation.

We join with other well-wishers in congratulating an old friend. The pioneering spirit that brought the Pennsylvania so successfully through its first century will—we are confident—carry it on to new pinnacles of achievement.



WESTINGHOUSE AIR BRAKE COMPANY

WILMERDING, PA.



MAKING AN IDEAL A REALITY

The ideal of The Otis Elevator Company for many years has been to provide the best and safest elevator transportation possible. To insure uniformity and the best results, each piece is manufactured by us under strict supervision; and the complete elevator is then installed by trained Otis mechanics.

Only one thing more has been necessary to make this ideal a reality, and that is a service which undertakes to maintain the completed elevator in the same fine condition in which it was when installed.

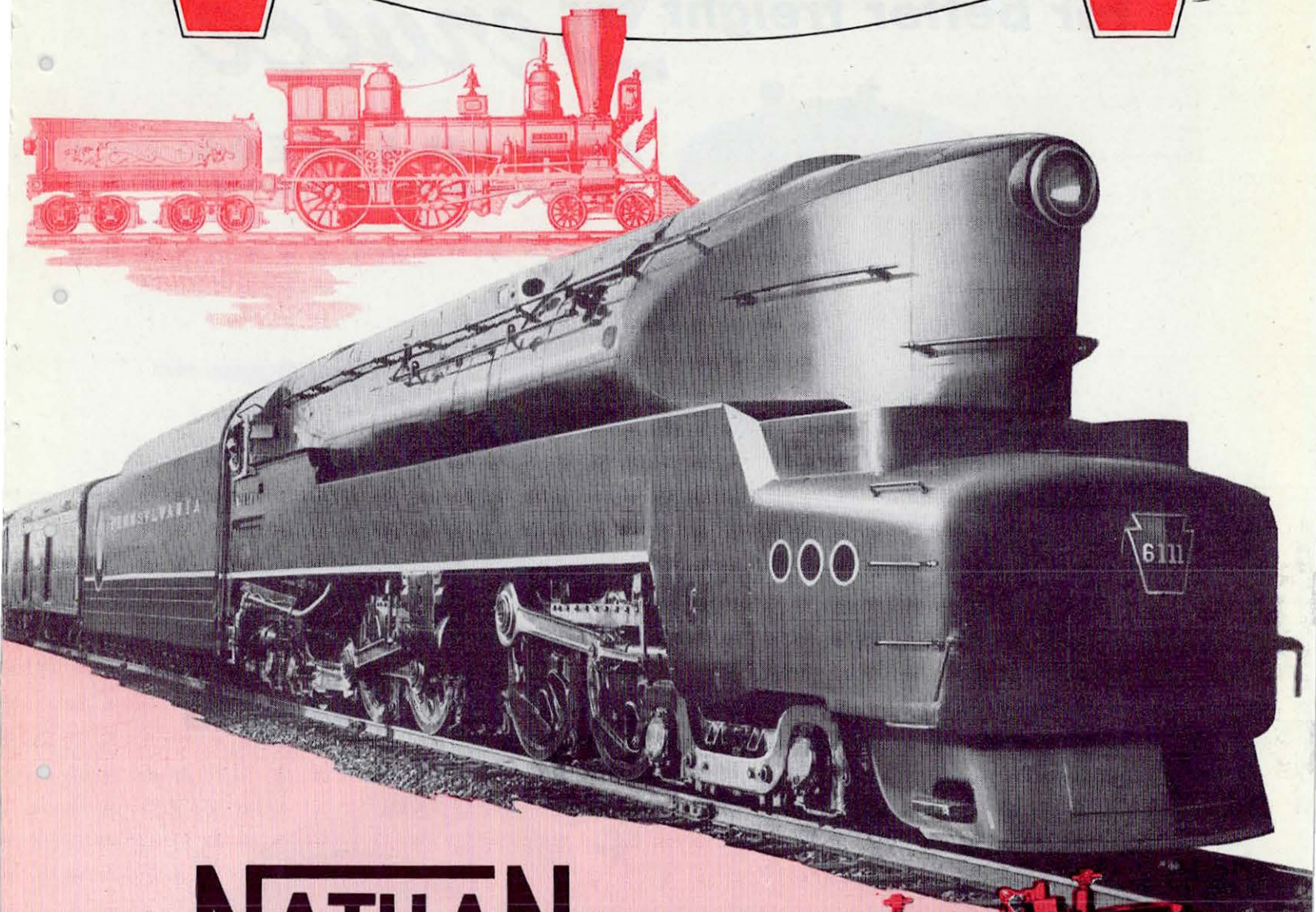
It is possible for owners of Otis elevators to contract directly with us, as manufacturer, for complete maintenance, to keep Otis elevators in the best condition, and preserve the elevator investment intact.

OTIS ELEVATOR COMPANY

Offices in all principal cities

Congratulations

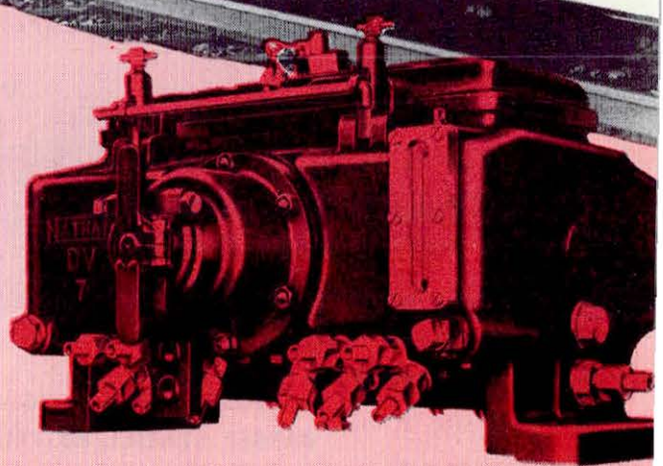
1846 **PENNSYLVANIA** 1946



NATHAN

Salutes

A CENTURY OLD COMRADE



WE CONGRATULATE the Pennsylvania Railroad upon its splendid hundred-year record of accomplishments.

From the early Pennsylvania locomotives with high smoke stacks and primitive cow-catchers to the modern powerful T-1 type, the geared-turbine and electric locomotives represent Pennsylvania motive power progress which is consistently keeping pace with the advanced requirements of railroad service.

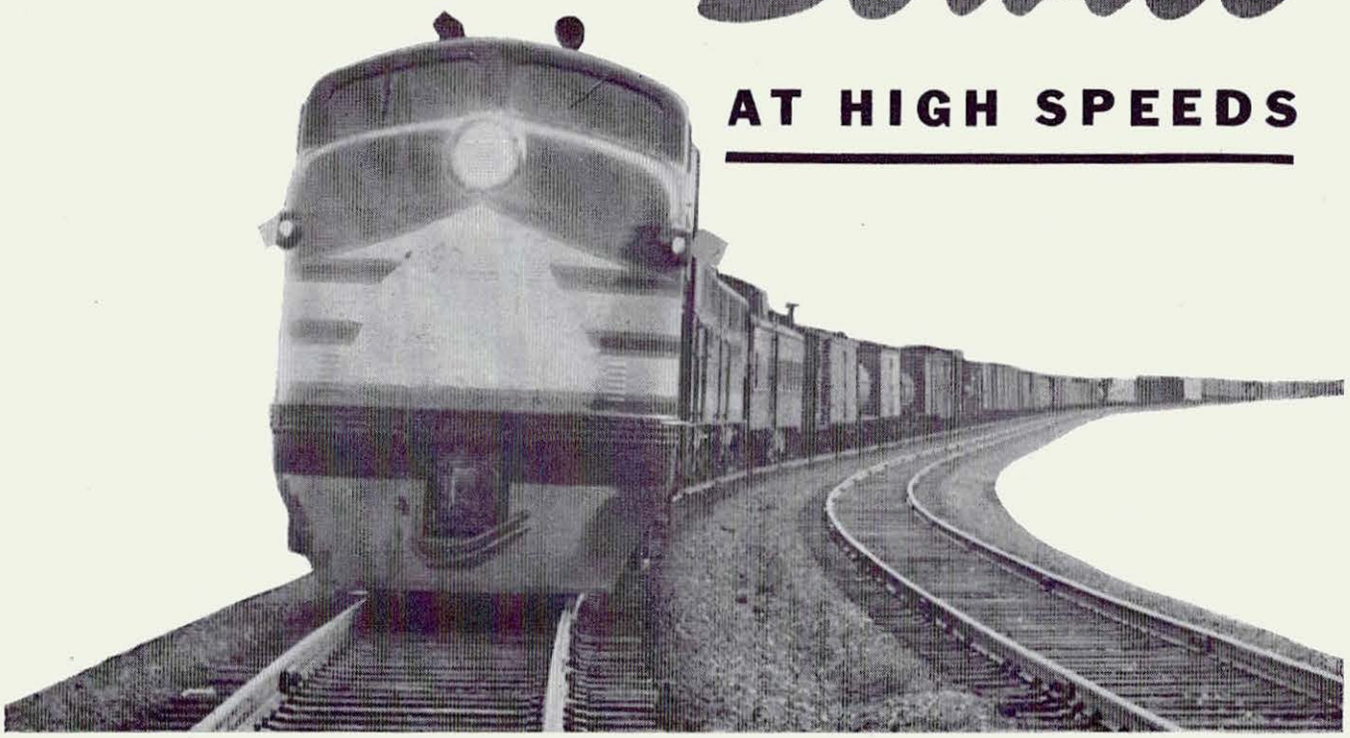
For eighty-five years "Nathan" has been identified with locomotive progress, and during this time we have been proud to serve the Pennsylvania Railroad and to have contributed to the development of better motive power in the advancement of railroad transportation.

NATHAN MANUFACTURING CO., 416 East 106 St. NEW YORK 29, N.Y.

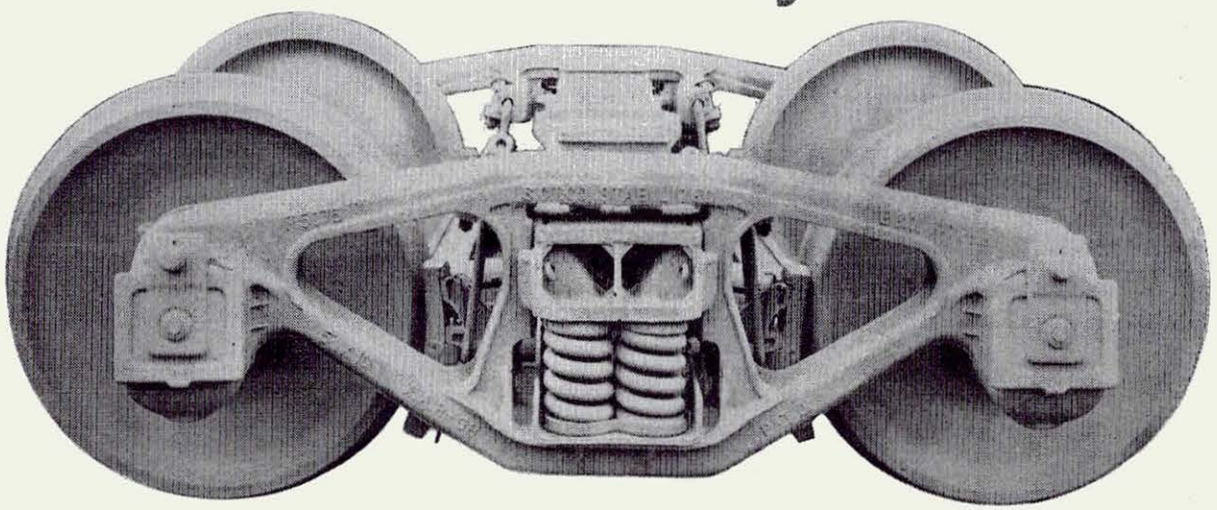
Established 1864

for better freight car *Service*

AT HIGH SPEEDS



use BARBER *Stabilized* TRUCKS



The modern engineering design of BARBER STABILIZED TRUCKS assures smooth and safe operation of freight cars at all speeds under any load condition. Damping is in proportion to car load — NOT A FIXED PRESSURE.

Over 105,000 car sets of modern BARBER STABILIZED TRUCKS are providing efficient, economical service on 57 different railroads and private car lines. Sufficient reason for knowing that when you specify Barber, you specify satisfaction.

STANDARD CAR TRUCK COMPANY
332 SOUTH MICHIGAN AVENUE — CHICAGO 4, ILLINOIS

On the 100th birthday of a great American railroad, Pullman-Standard congratulates the Pennsylvania on its high standard of railroading and its far-reaching contribution to the country's development.

●

For 80 of its 100 years the Pennsylvania has been served by the Pullman interests.

In another few years we will celebrate our own centennial. The growth of our two organizations has extended over the same period of expansion which has made the American Railroads the world's best.

1846-1946

Pullman-Standard CAR MANUFACTURING COMPANY

CHICAGO · NEW YORK · CLEVELAND · WASHINGTON, D. C. · PITTSBURGH · BIRMINGHAM · WORCESTER, MASS.

San Francisco Sales Representative, Mark Noble

NO TOUGHER JOB Than Stopping Rust Here But RUST-OLEUM DOES IT . . .

and we can prove it!

Lasting Protection for BRIDGES, SIGNAL TOWERS, BUILDINGS, WATER TANKS, etc.

What a beating bridges take from rust! Sulphur-loaded smoke, brine from dripping cars—plus rain, snow and condensation—set up ideal conditions for rapid formation of damaging rust. But, even under such extreme conditions, RUST-OLEUM, the scientific rust preventive, stops rust cold! Applied to the surface, even where rust already has a grip, it penetrates right through to virgin metal—actually incorporates rust right into the coating—and spreads a protective cover that lasts for years. This coating is tough, elastic and air-tight—won't blister, crack or peel off.

The result is year after year of savings in maintenance time, labor and material because bridges, signal towers and other right-of-way structures need less attention.

The rust-preventing qualities of RUST-OLEUM have been conclusively proved in practical tests. For years this remarkable preparation has been saving money for American Railroads. It will pay you to investigate RUST-OLEUM now. *Write today for Catalog 145 for recommended applications.*

Check These Features:

- Apply directly over any rusted surface. Simply wire brush to remove loose scale, blisters and dirt.
- Rust-Oleum penetrates the remaining rust and spreads an unbroken protective film over the entire surface.
- It's easy to apply by brush, dip or spray—Saves time, money and labor.
- Excellent coverage . . . Gallons of economy.

RUST-OLEUM CORPORATION

2415 Oakton Street **Evanston, Illinois**

PHILCO

Salutes the

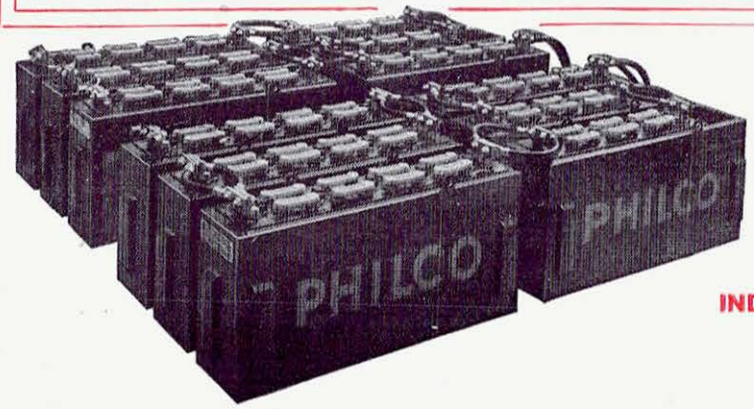
PENNSYLVANIA

RAILROAD SYSTEM

on its

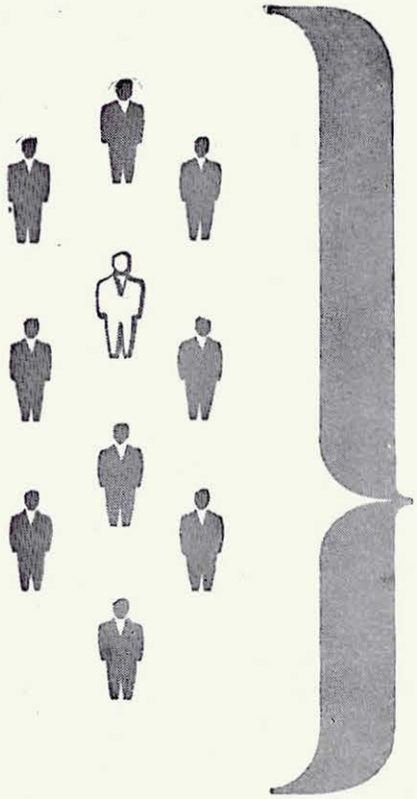
100th ANNIVERSARY

April 1946



PHILCO

FOR FIFTY YEARS A LEADER IN
INDUSTRIAL STORAGE BATTERY DEVELOPMENT



9 OUT OF 10 *want* THE PAYROLL SAVINGS PLAN CONTINUED!

Thanks to the cooperation and encouragement of America's industrial executives, 85 million bond holders have bought U.S. Bonds in the greatest savings program in history. Employees who have purchased billions of dollars of these bonds during the war now want to continue monthly purchases of savings bonds. Specific evidence of this desire to continue saving for personal security and prosperity through the Payroll Savings Plan was recently revealed by a survey which disclosed that 90% wanted the Plan continued.

Every employer can write in his own set of reasons why the Payroll Savings Plan should be continued as a part of his personnel relations program, but the principal advantages are obvious:

A large reservoir of national savings; a strong and stable bulwark against inflation.

An "automatic" thrift habit for the worker; to increase contentment and satisfaction in his job.

An opportunity for the employee to maintain his "share in America" with the safest, easiest, most profitable investment he can make.

An opportunity for the returned veteran to share in the Payroll Plan's varied benefits.

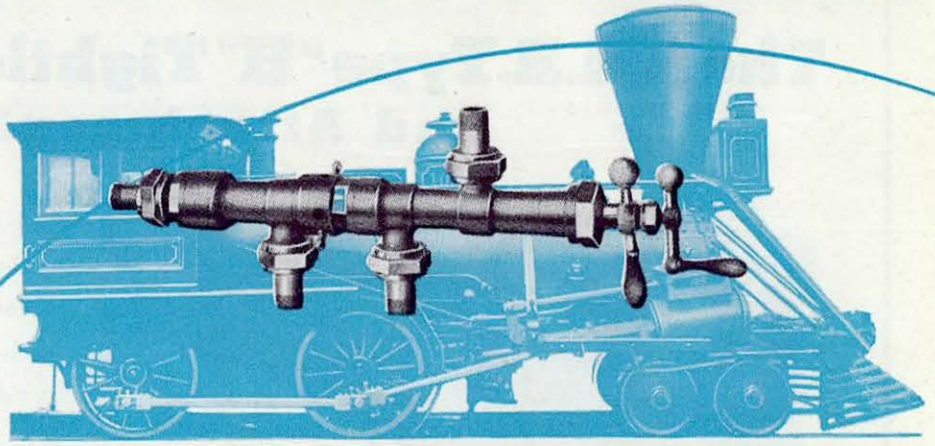
Your employees will require little "selling" on the idea—they are accustomed to their monthly saving habit. With the Treasury Department's savings bond program now in peacetime operation, your partnership is again invited to continue this systematic, convenient means of contribution to a prosperous peacetime future.

The Treasury Department acknowledges with appreciation the publication of this message by

RAILWAY AGE

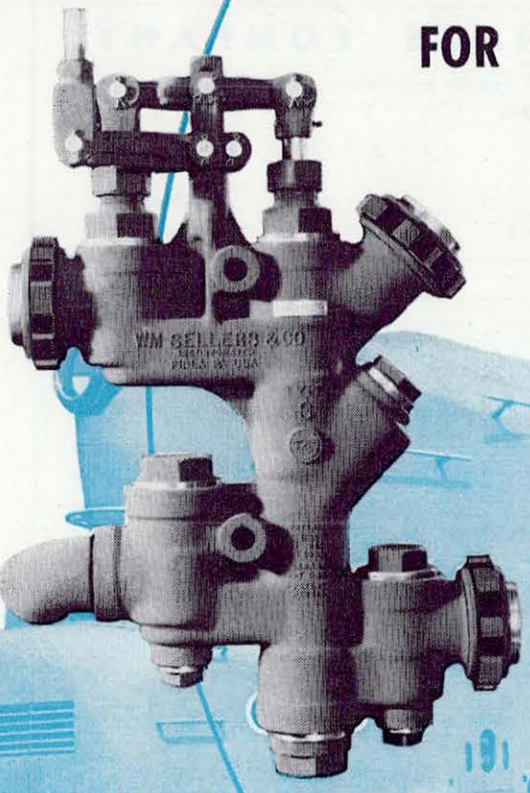
This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and Advertising Council

SELLERS SALUTES THE PENNSYLVANIA RAILROAD ON ITS CENTURY OF RAILROAD PROGRESS



100 YEARS OF YESTERDAYS...

FOR RICHER, MORE EFFICIENT TOMORROWS



Tomorrow's progress is based upon Yesterday's experience, and the use to which that experience is put. Nowhere is this truth better demonstrated than in the field of Railroading.

Since 1846, the Pennsylvania Railroad has been accumulating its vast backlog of experience. It has used this experience as the raw material—not the finished product—of Knowledge . . . and has processed Experience with Vision through all those great historic years.

Through these same American years, Sellers has been the Pennsylvania's companion in experience. In fact, Sellers had been sharing its own experience with railroads even before the time, 85 years ago, when a Sellers Injector was first installed on a "Pennsylvania" locomotive.

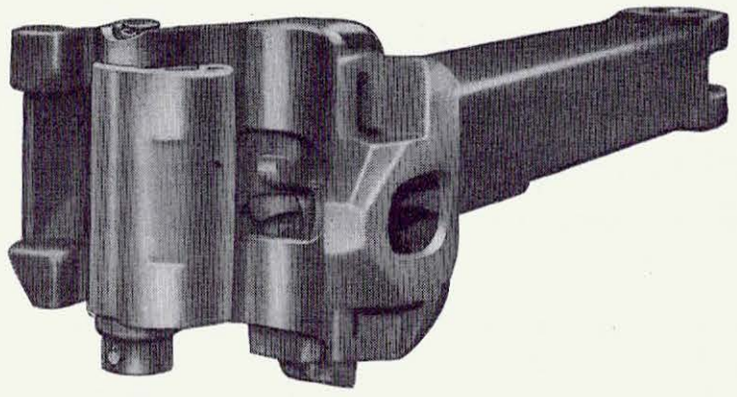
FOUNDED SELLERS 1848

William Sellers & Co., Inc.

PHILADELPHIA, PA.

MACHINE TOOLS, GRINDERS, HYDRAULIC EQUIPMENT, SHIP MACHINERY, INJECTORS

The A.A.R. Type "H" Tightlock Coupler and Attachments



A.A.R. Type "H" Tightlock Coupler eliminates free slack in coupler contours — reducing end shocks. Interlocking features provide maximum safety.

A.A.R. Tightlock Coupler Attachments provide maximum strength and universal swivel with minimum wear.

THE BUCKEYE STEEL CASTINGS COMPANY

Manufacturers of Couplers, Draft Attachments, Truck Frames and Bolsters
Six- and Eight-Wheel Tender Trucks

COLUMBUS 7, OHIO

NEW YORK CHICAGO

To the Pennsylvania Railroad...

Our sincere congratulations on your 100th anniversary...100 outstanding years of service to your country.

We are proud to be among those who have had the opportunity of serving you . . .

DURAMETALLIC CORPORATION
NEWARK, NEW JERSEY

1846
•
1946

DURAMETALLIC CORPORATION
KALAMAZOO MICHIGAN

Manufacturers of PACKINGS for — AIR PUMPS • STOKERS • EXPANSION JOINTS • CAB COCKS • WATER GAGE GLASS • FEED WATER PUMPS • VALVE STEMS • REVERSE GEARS and DURA HOOK PACKING PULLERS

Happy Birthday to the Pennsylvania

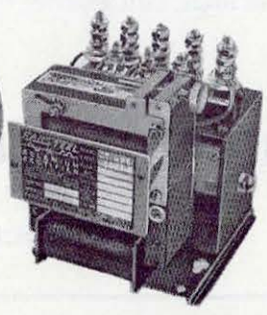
It is a pleasure to be a part of this issue, honoring the Pennsylvania Railroad and we welcome this opportunity to extend our best wishes on this, your 100th Birthday Anniversary.

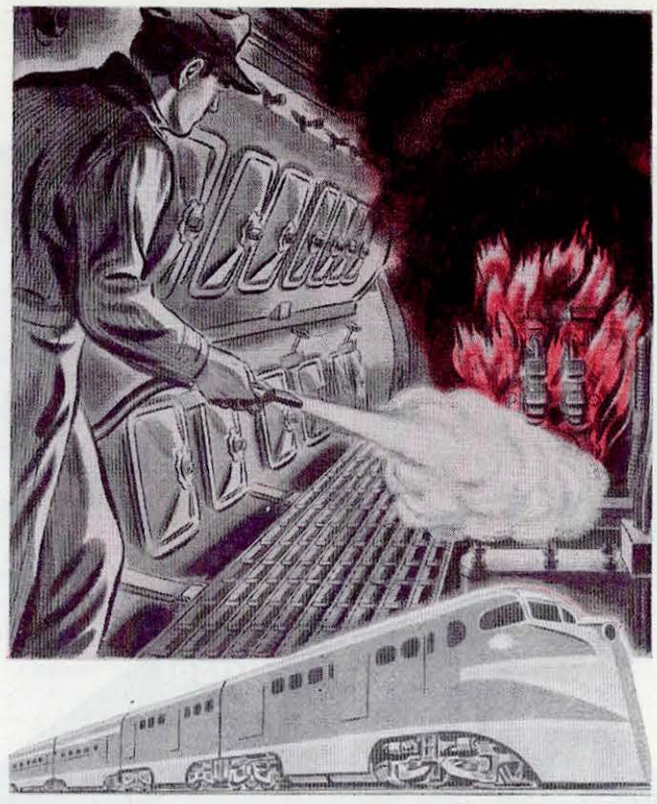
It has been our privilege to be one of your suppliers since 1924.

We are proud that you, a pioneer railroad, cooperated with us in pioneering the Fansteel-Balkite Taper Rectifier, and again in the introduction of Selenium Signal Rectifiers. The Pennsylvania installed some of the very first of these Fansteel products and are continuous users of them, in addition to Fansteel Power Units for communications service and Fansteel-Balkite Arresters.

We are indeed proud of our many years of pleasant associations with Pennsylvania signal and communications men, and to you we say again: "Happy Birthday and Many More"

FANSTEEL
METALLURGICAL CORPORATION
NORTH CHICAGO • ILLINOIS





Dugas 15-T Hand Extinguisher

STOP FIRE FASTER WITH

AN ANSUL PRODUCT
duGas
REG. U.S. PAT. OFF.
THE MASTER OF FLAME

DRY CHEMICAL

● Upon striking fire, DUGAS Dry Chemical instantaneously releases 1100 times its volume in flame-smothering gas that chokes off fire in seconds. The swift, fire-stopping power of DUGAS Dry Chemical is unaffected by wind or draft. It is undiluted by passage through the air. The gas is released only in the immediate flame area.

Dangerously close approach to flames is eliminated because the stream of dry chemical is expelled under high pressure, permitting safer, longer range fire extinguishing operation.

Amazingly fast and effective, DUGAS Extinguishers provide more fire protection . . . per pound . . . per unit . . . per dollar . . . against all types of oil, gasoline, grease, paint, and electrical equipment fires. **And DUGAS Extinguishers can be recharged on the spot.**

INSTALL DUGAS EXTINGUISHERS AT THESE HAZARD SPOTS

- Maintenance and Repair Shops
- Paint Shops
- Diesel, Gasoline and Electric Rolling Stock
- Oil and Fuel Storage and Handling
- Generating and Sub-Stations

GET THE FACTS ON DUGAS EXTINGUISHERS

Write today for further information including authoritative, impartial data showing characteristics of all types of approved fire extinguishers. The Ansul technical staff of fire protection engineers is ready to serve you.

Listed and approved by Underwriters' Laboratories and Factory Mutual Laboratories.

SEND FOR BULLETIN 222.

ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN

A Challenge Met!

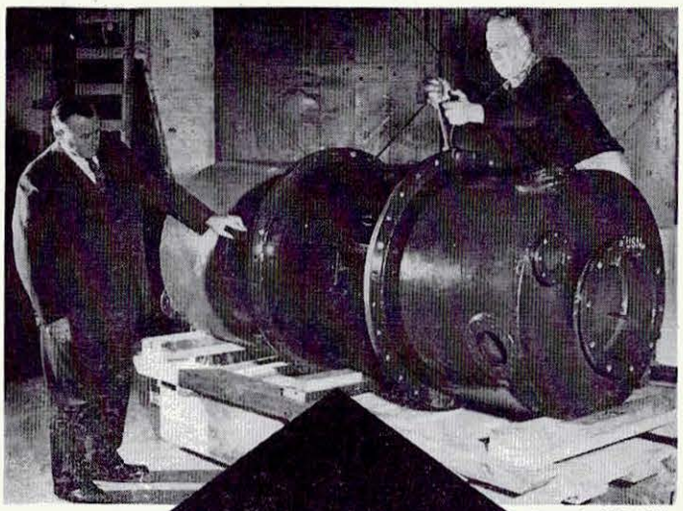


Photo by "Finish" Magazine

Corrosion-Resistant Exhaust Silencers FOR U. S. SUBMARINES

The Navy, in its war operation of thousands of craft powered with Diesel engines, had encountered a particularly vexing problem in the corrosion of Exhaust Silencers. SEAPORCEL special formula met the challenge and delivered to the Navy in all parts of the world, exhaust silencers which are resistant to Marine CORROSION, ACID, IMPACT AND THERMAL SHOCK.

For solution of your troublesome corrosion problems, consult our engineers, who may be able to aid you in developing a "cure," just as we did for the Navy.

SEAPORCEL* applied to fabricated assemblies of sheet steel can contribute permanent color finishes to your elements of design.

Let us send you fuller particulars—No obligation

[* Seaporcel (Reg. U. S. Pat. Off.) is a ceramic coating fused into its metal base at 1550 degrees F.]

Seaporcel

SEAPORCEL PORCELAIN METALS, INC.
Formerly Porcelain Metals, Inc.
28-10 BORDEN AVENUE, LONG ISLAND CITY 1, N. Y.

Congratulations

and

Best Wishes

to the

PENNSYLVANIA RAILROAD

on its

First Centennial

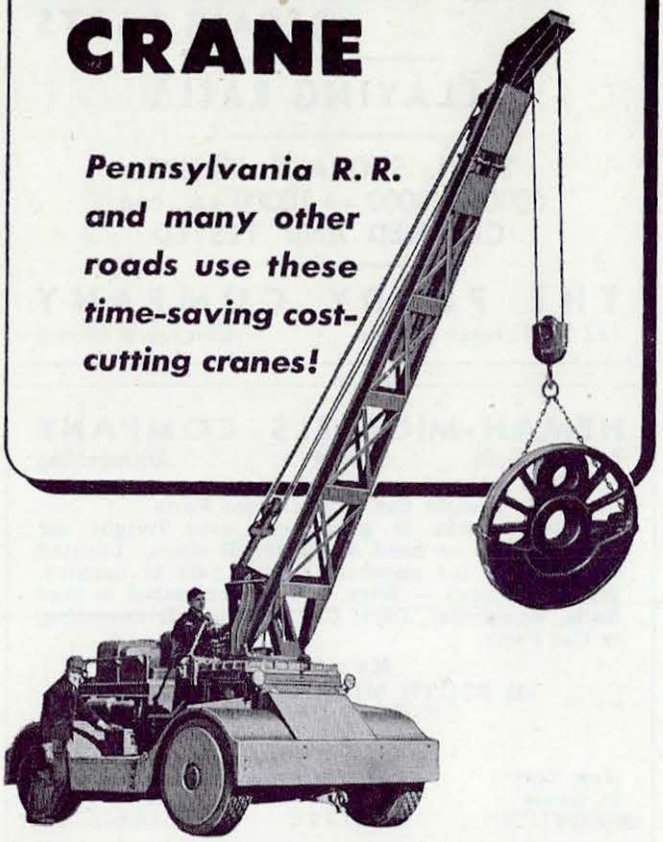
The Hundredth Anniversary of the Pennsylvania Railroad is an event of significance to all America — a milestone in national growth and progress to which railroads have made such effective contribution.

RAILWAY EXPRESS AGENCY INC.

NATION-WIDE SERVICE

ROUSTABOUT CRANE

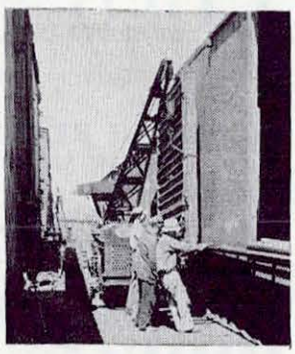
Pennsylvania R. R. and many other roads use these time-saving cost-cutting cranes!



The fast-action load-handler all around your yards

Hundreds of users who have bought the Roustabout with a few jobs in mind, soon had it speeding 101 jobs of loading, unloading, moving, shifting and stacking, indoors but especially out. Mobile, it's *where* you want it *when* you want it — over rough ground or smooth, up hill and down, handling anything to 7½ tons. Modernly engineered for years of overwork, ball-bearing boom turntable and gears all running in oil. It saves costly delays and manpower, quickly pays for itself. Write for the whole efficiency story now; no obligation, of course.

THE HUGHES-KEENAN CO.
652 Newman St., Mansfield, Ohio



● It works in tight quarters . . . between railroad cars . . . in narrow aisles.

● Speeding repairs for Minneapolis, St. Paul & Sault Ste. Marie R. R., Minneapolis.

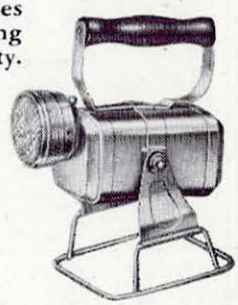
Roustabout Cranes
By Hughes-Keenan
Load-Handling Specialists Since 1904

Ever since the Pennsylvania Railroad received its charter 100 years ago, great things have been happening in America. Always, it has been open country for achievement.

Such leaders as the Pennsylvania railroad are an integral part of this enormous and fascinating panorama of American progress. The panorama of thousands of men building thousands of businesses—big businesses, little businesses — towards the end that America might be a greater country. That its multitudes might enjoy in their daily living greater convenience, greater safety.

For convenience and safety along the railroad right-of-way, Justrite has for years been producing lanterns such as these — the "Trainman's Favorite," Model No. 40, and the Inspector's Lantern, Model No. 2111. Finely built lanterns that provide safe, dependable light for the men who keep the trains rolling!

Model No. 40



Model No. 2111

Justrite Safety Products are a required item on many leading railroads. See your supplier—today!

JUSTRITE MANUFACTURING CO.
2063 N. Southport Ave., Dept. D-1, Chicago 14, Illinois

Traffic Managers . . .

THE RAPID RATE FINDER

By Frank J. Meenahan

Agent, Reading Co., Mahanoy City, Pa.

With this record book for freight, express and parcel post rates properly filled out a billing clerk can rate a waybill to a destination in the United States, Canada or Mexico within half a minute. He does not have to spend from five to fifteen minutes working through a tariff book with its many cross-references and amendments of rates and classifications.

The traffic manager can fill out the blank forms in the book with first class freight rates and preferred routings of shipments to destinations he is most interested in. The billing clerk can follow through for other classifications as needed.

Based on the author's 25 years' experience and in use by hundreds of freight agents in all parts of the country.

1945. 125 pages, 8¼ x 10½, loose-leaf, paper, $2.50

Money Back if Not Satisfied

◆

Book Department

SIMMONS-BOARDMAN PUBLISHING CORPORATION

30 Church Street New York 7, N. Y.

RAILROAD EQUIPMENT
CARS — LOCOMOTIVES
REPAIR PARTS

RELAYING RAILS

STEEL STORAGE TANKS
6000 — 8000 — 10000 gal. cap.
CLEANED AND TESTED

THE PURDY COMPANY
122 S. Michigan Avenue Chicago 3, Illinois

HYMAN-MICHAELS COMPANY
Relaying Rails ★★★ Dismantling
Used railroad equipment—cars—locomotives
Freight Car Replacement Parts
Complete stocks of guaranteed used freight car parts carried on hand by us at all times. Located conveniently for shipment to any part of country. Write — Phone — Wire — when interested in used Rails, Equipment, Cars, Car or Track Dismantling, or Car Parts.

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122 SOUTH MICHIGAN AVENUE
CHICAGO, ILLINOIS

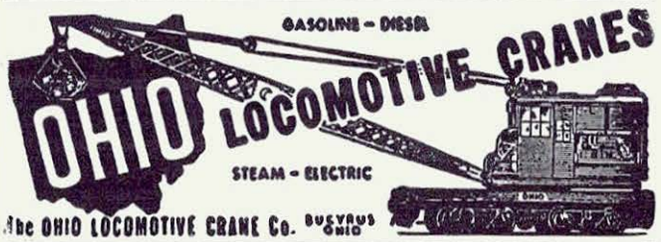
Branches

New York	San Francisco	Houston
St. Louis	Los Angeles	Havana, Cuba
SERVICE	QUALITY	RELIABILITY

GOLD CAR HEATING SPECIALTIES OF QUALITY

STEAM — VAPOR — ELECTRIC

GOLD CAR HEATING & LIGHTING CO.
33-35TH STREET, BROOKLYN, N. Y.



BUY
VICTORY
BONDS
TO FINISH
THE JOB

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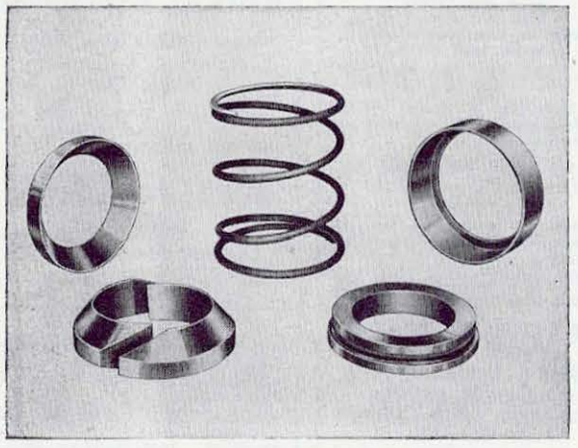

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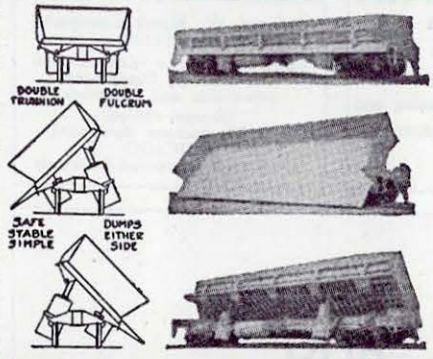

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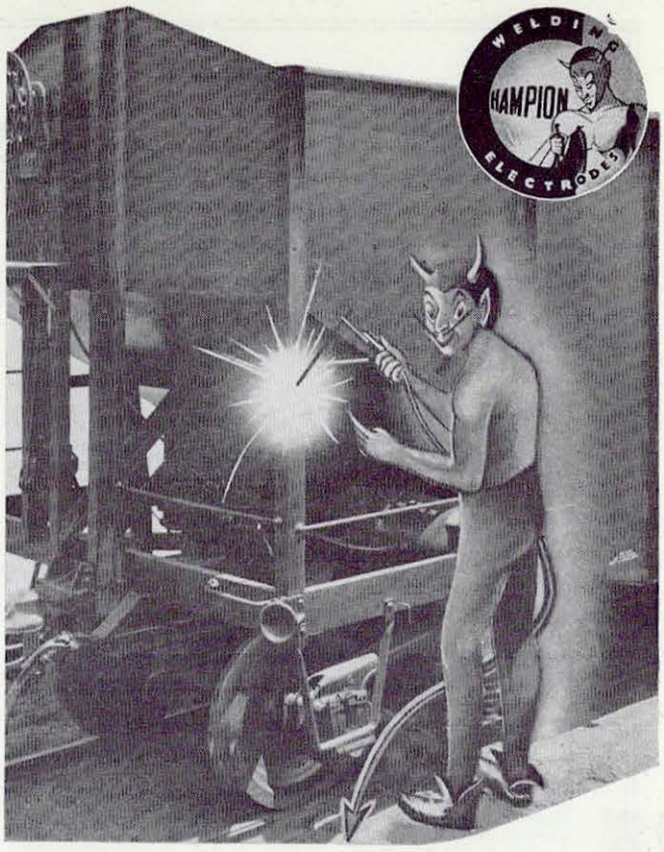

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Index to Advertisers

April 13, 1946

A

Aluminum Company of America 43
American Arch Co., Inc. 84, 85
American Car & Foundry Company 40, 41
American Locomotive Company ..... 19 to and incl. 22
American Optical Company 36
American Photocopy Equipment Co. 107
American Steel Foundries 25
Anemostat Corporation of America 27
Ansul Chemical Company 103
Associati n of American Railroads 26
Automatic Transportation Company, Div. of The Yale & Towne Mfg. Co. 33

B

Baldwin Locomotive Works, The ..... 71 to and incl. 74
Bethlehem Steel Company 3
Buckeye Steel Casting Company, The 102
Budd Manufacturing Company, Edward G. 8, 9

C

Carey Co., Inc., Thomas F. 108
Caterpillar Tractor Co. 29
Champion Rivet Company, The 109
Classified Advertisements 108
Colegate Aircraft Corporation 17

D

Dewart, H. M. 108
Differential Steel Car Co. 107
Dulien Steel Products, Inc. 107
Duner Company 109
Durametallic Corporation 102

E

Eastern Fabricators, Inc. 109
Edgewater Steel Company 24
Edison Storage Battery Division of Thomas A. Edison, Incorporated 58
Electric Storage Battery Company, The 12
Elwell-Parker Electric Company, The 16

F

Farnsworth Television & Radio Corporation 48
Fansteel Metallurgical Corporation 103
Frank, M. K. 108
Franklin Railway Supply Company, Inc. 82, 83
Frisco Lines 46
Frampton & Company, D. B. 49

G

General Cable Corporation 69
General Electric Company ..... 19 to and incl. 22, 60, 61
General Railway Signal Company ..... Back Cover
General Steel Castings 14, 15
Get Together Department 108
Glidden Company, The 63
Gold Car Heating & Lighting Co. 106
Gould Storage Battery Corporation 18
Great Lakes Steel Corporation 23
Gustin-Bacon Manufacturing Company 66

H

Hajoca Corporation 34
Heywood-Wakefield 30
Houde Engineering Division of Houdaille-Hershey Corporation 56
Hughes-Keenan Co., The 105
Hunt Company, Robert W. 108
Hunt-Spiller Mfg. Corporation 87
Hyatt Bearings Division, General Motors Corporation 42
Hyman-Michaels Company 106

I

Industrial Brownhoist Corp. 31
Ingalls Iron Works Company, The 108
International Business Machines Corporation 52
Iron & Steel Products, Inc. 108

J

Johns-Manville 91
Justrite Manufacturing Co. 105

K

Kershaw Company, Inc., The 108

L

Lima Locomotive Works, Incorporated 81
Locomotive Finished Material Co., The 67

M

Magnus Metal Corporation 38
Maguire Industries, Incorporated, Electronics Division 37
Miner, Inc., W. H. 55
Missouri-Kansas-Texas Lines 59

N

Nathan Manufacturing Co. 95
National Bearing Division, American Brake Shoe Company 39
National Malleable & Steel Castings Company 28

O

Ogle Construction Co. 68
Ohio Locomotive Crane Company 106
Okonite Company, The 76
Otis Elevator Company 94

P

P & M Co., The 75
Pennsylvania Railroad 4, 5
Philco Corporation, Storage Battery Division 99
Porter Company, Inc., H. K. 2
Pullman-Standard Car Manufacturing Company 97
Purdy Company, The 106

R

Railway Educational Bureau, The 108
Railway Express Agency, Inc. 104
Railway Maintenance Corp. 13
Republic Steel Corporation 54
Rust-Oleum Corporation 98

S

Safety Car Heating & Lighting Co., Inc., The 62
Safety First Shoe Company 35
Schaefer Equipment Company 51
Scullin Steel Co. 57
Sellers & Co., Inc., Wm. 101
Seaporcel Porcelain Metals, Inc. 104
Shell Oil Company, Incorporated 70
Silent Hoist & Crane Co. 107
Simmons-Boardman Publishing Corporation 106
SKF Industries, Inc. 10, 11
Socony-Vacuum Oil Company, Inc. 6, 7
Sonken-Galamba Corporation 108
Standard Car Truck Company 96
Standard Railway Equipment Mfg. Company 80
Standard Stoker Company, Inc., The 32
St. Louis-San Francisco Railroad 46
Superheater Company, The 86
Superior Car Door Co. 53
Symington-Gould Corporation, The 111

T

Truscon Steel Company, Subsidiary of Republic Steel Corporation 54

U

Union Asbestos & Rubber Co. 44, 45
Union Switch & Signal Company 78, 88, 89
United States Rubber Company 90
U. S. Metallic Packing Co., The 107

W

Waugh Equipment Company 47
Westinghouse Air Brake Company 92, 93
Westinghouse Electric Corporation 64, 65
Wine Railway Appliance Co., The ..... Front Cover

Y

Yale & Towne Mfg. Co., Automatic Transportation Company Division 33
Yosemite Valley Railway 109
Youngstown Sheet and Tube Company, The 50

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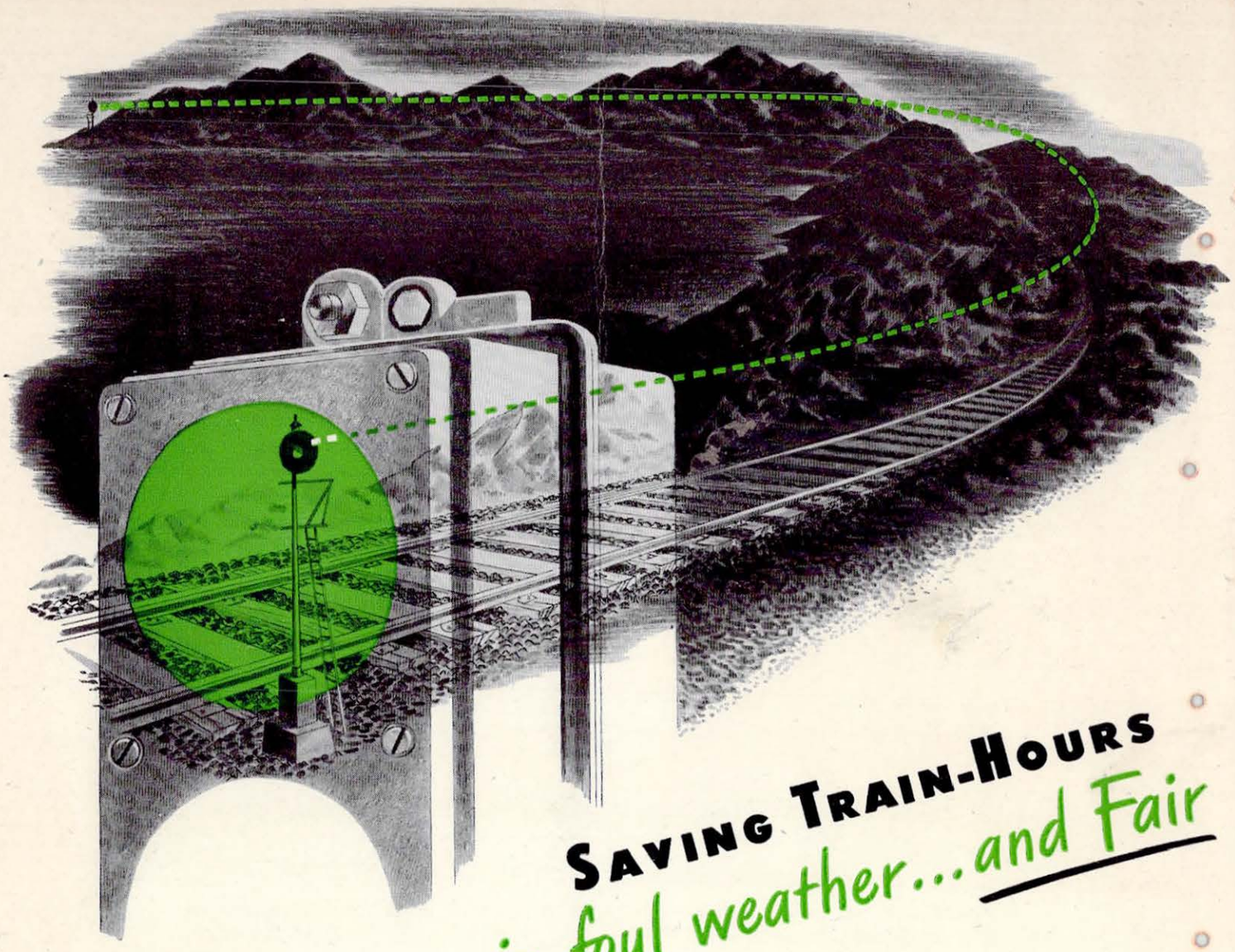

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